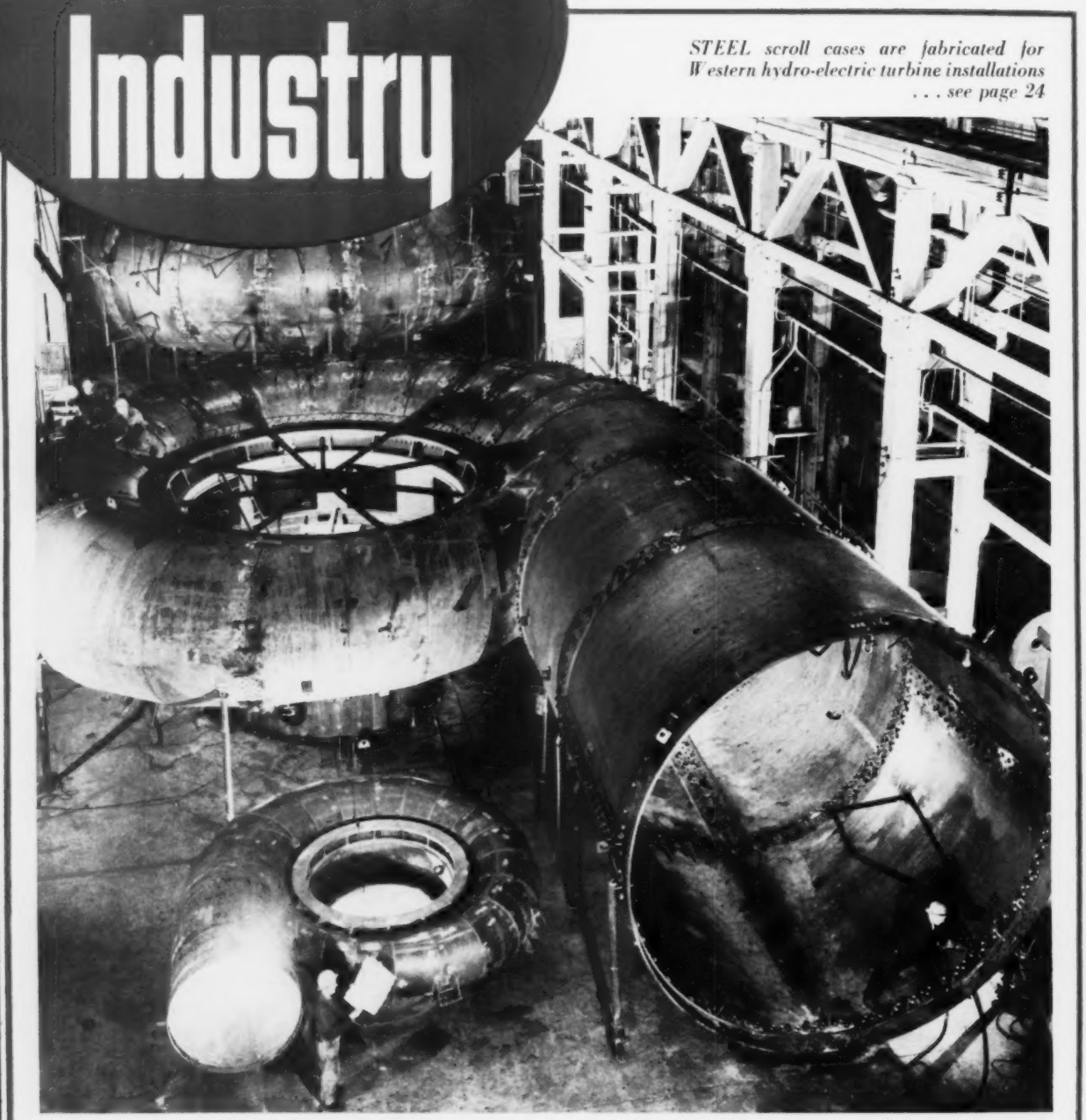
Western Industry

May 1955



STEEL scroll cases are fabricated for Western hydro-electric turbine installations *. . . see page 24*

Economic nuclear power tested

Quality control upgraded

Mechanizing for more castings

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Western Industry

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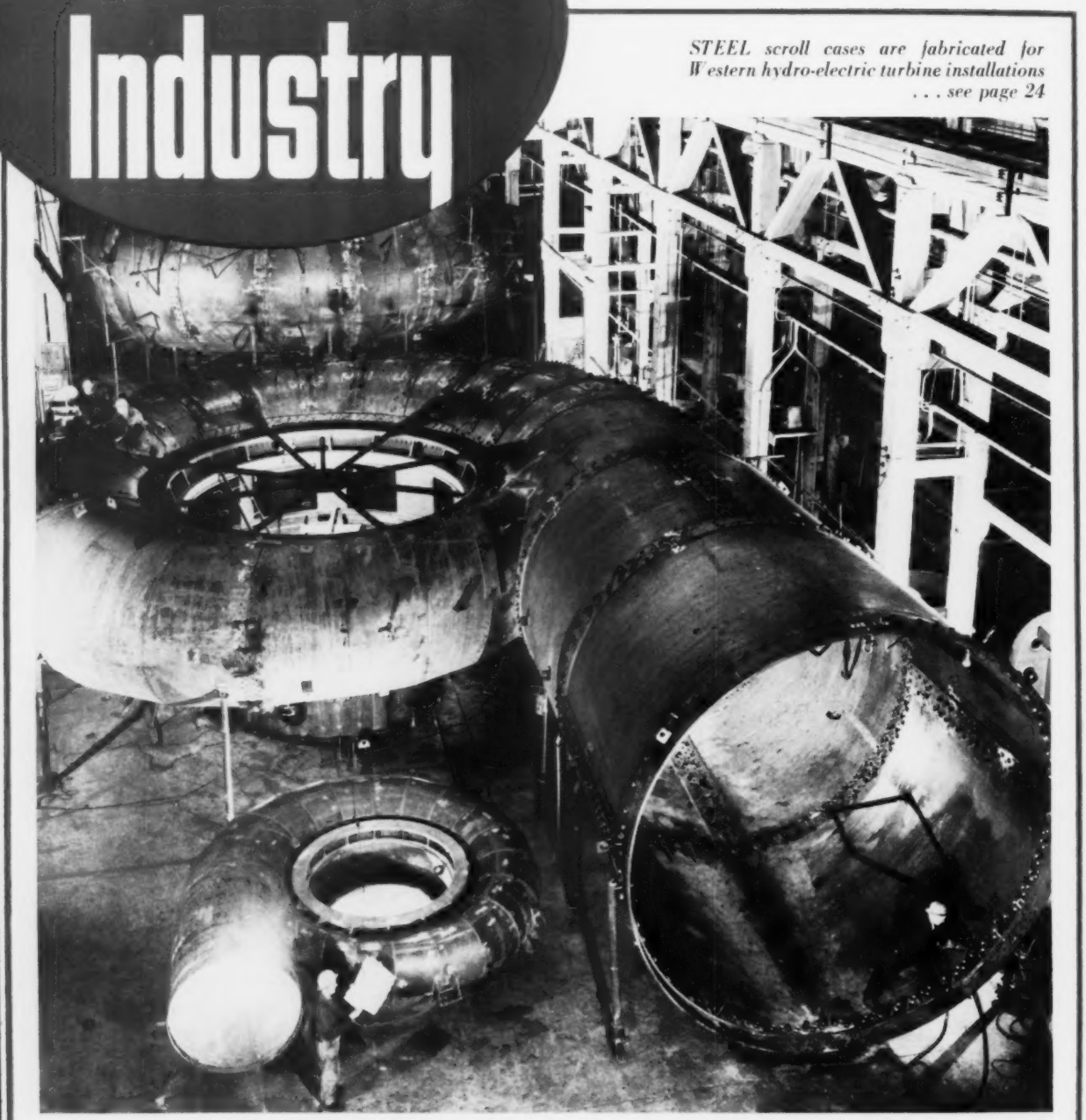

STEEL scroll cases are fabricated for Western hydro-electric turbine installations *. . . see page 24*

Economic nuclear power tested

Quality control upgraded

Mechanizing for more castings

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5

New SKIL Shear Sweeps Field in Actual Comparison Tests!

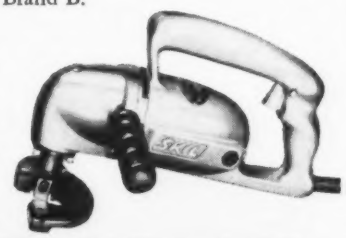
SKIL Model 231 Wins 5 Trials Out of 5 Outperforms, Outproduces All Others

Actual tests prove what many sheet metal men are learning for themselves. The new SKIL 231 Shear is far superior to all others on the market. These tests show the speed, power, and control that are making the SKIL Shear so popular on every job . . . in every shop.

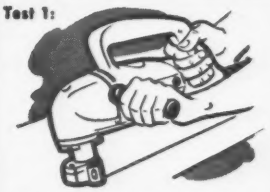
Here are actual results of impartial tests of the SKIL Model 231 Shear and competitive brands. Shown are performance figures for SKIL, Brand A, and Brand B.

SKIL SHEAR 231—Best All-Around

The results show that the 231 is the best all-around Shear on the market today. Faster, easier handling, more powerful! Features like the Contour Grip Handle at the rear of the tool make it a favorite with workmen who have tough cutting to do. Improved foot design keeps maintenance costs down for job superintendents. This is the shear you need in *your* shop. The SKIL Model 231.



Test 1:



25" Trial Cut of 12 Gauge Metal
Model 231.....9.2 seconds
Brand A.....15.3 seconds
Brand B.....12.0 seconds

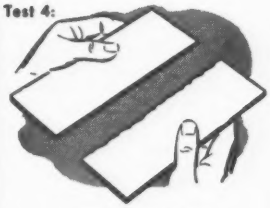
Test 2:

Cutting Right and Left Hand Circles
Model 231.....22.0 seconds
Brand A.....24.0 seconds
Brand B.....22.2 seconds

Test 3:

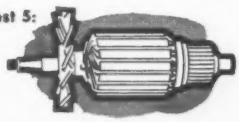
Small Diameter of Circular Cuts
Model 231.....1½"
Brand A.....2"
Brand B.....(right hand) 2½"
(left hand) 4½"

Test 4:



Cleanness of Cuts
Model 231.....Excellent
Brand A.....Good
Brand B.....Poor

Test 5:



Power and Performance
SKIL 40% more powerful than Brand A and 33⅓% more powerful than Brand B.

FREE! Mail the Coupon for a Demonstration and a FREE Trial of the SKIL SHEAR Model 231! See How Much Faster, Easier-Handling this New SKIL Shear is on your Toughest Cutting Job!

•

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Western Industry

May 1955

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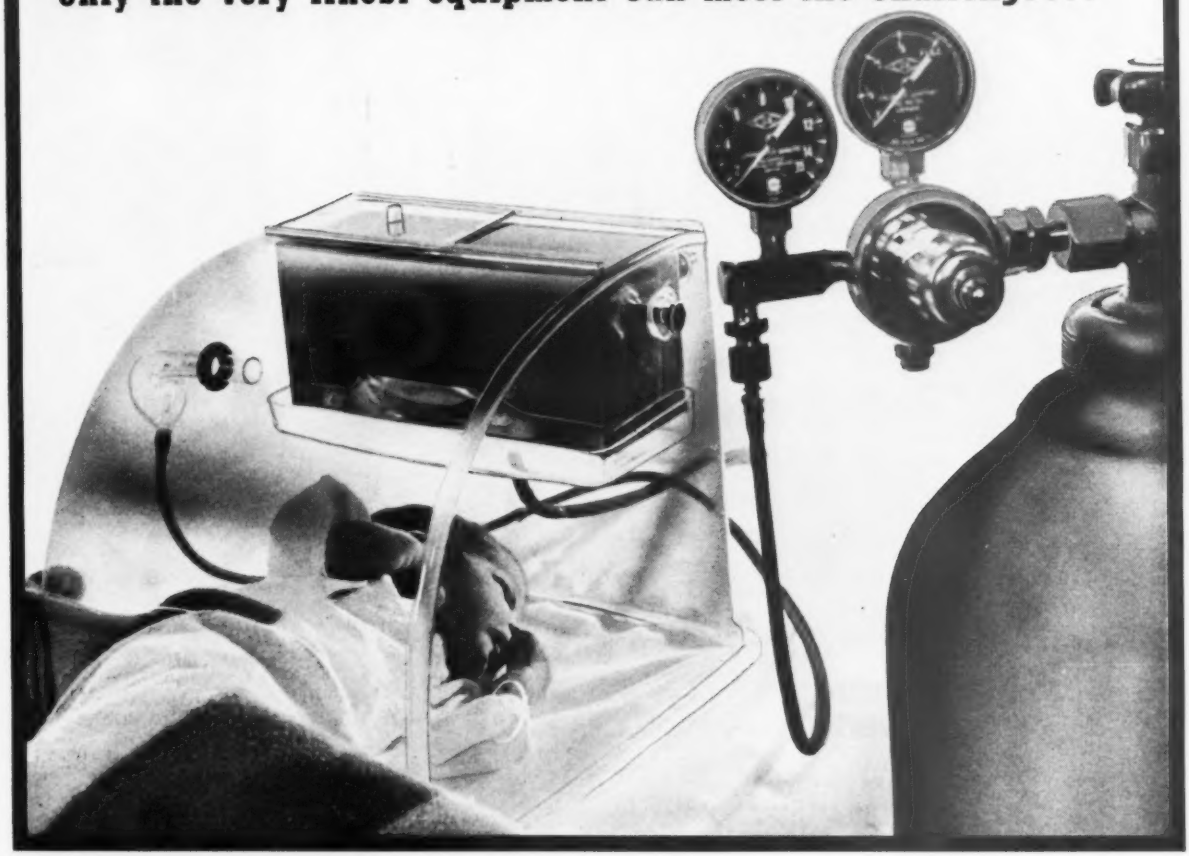

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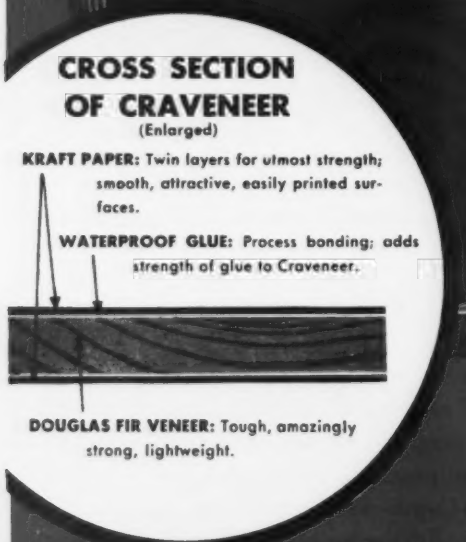
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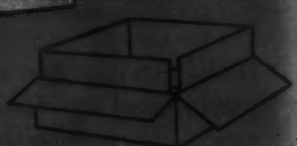
Turkey box

Tomato tray



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Wirebound container

Lightweight disposable pallet

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As a material for containers, or as an integral part of a product, Craveneer has already proved its value in widely varied fields. Just a few of its many time-saving, cost-cutting applications are shown here. A Cabco engineer can explain its properties, help determine how Craveneer can be of greatest value to your company.

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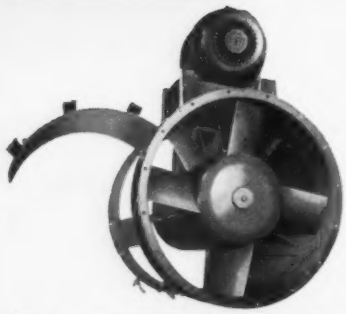
CFM



Two large access doors in the fan casing allow speedy inspection and cleaning.

Spray Booth Fan

The Spray Booth Vaneaxial Fan combines the efficiency and flexibility of the Vaneaxial Arrangement 9 with the convenience of two large, quick opening access doors in the fan casing. In addition to the doors, the design includes specially arranged guide vanes and increased running clearance between blade tips and casing to prevent clogging.

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an AMFORGE analysis saved 40,000 pounds of steel for a customer

And the savings were found in the AmForge Upset Method of forging.

On an order for 25,000 of these gear blanks (half section shown above), AmForge saved 20 tons of steel, high freight costs and heavy machining expenses compared to the former method of forging which had resulted in a solid hub as well as no reduction in diameter between the collar and the gear proper.

How? AmForge analyzed the problem from the same blueprint and specifications that had been used for the old method, but AmForge showed the customer that this piece could be adapted to its modern upset method.

When the forging was delivered to the customer, not only did he gain these tremendous savings but he got a better forging as well. It showed a denser structure and greater resistance to distortion in heat-treating operations due to a radially upset grain. This also gave all gear teeth a uniform, maximum strength.

This is just another example of how AmForge has been able to find savings for its customers through an AmForge Analysis. With its modern upset and press forging facilities at Azusa, California, AmForge offers its forging "know-how" plus the added advantage of lower freight costs to West-Coast manufacturers.

Satisfy yourself as to whether you can save with AmForge by sending in a blueprint, sketch or sample for an AmForge Analysis—no obligation, of course.

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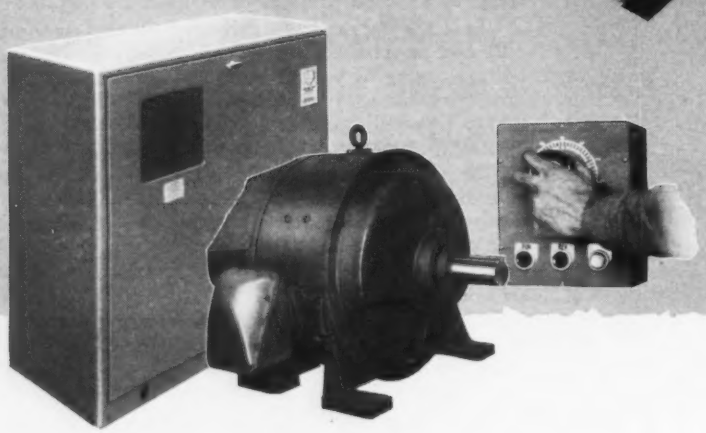

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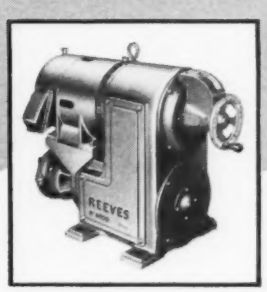
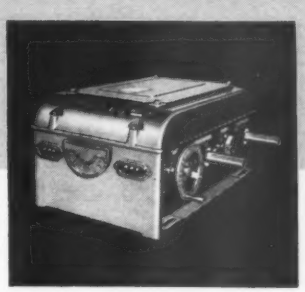




REEVES PULLEY COMPANY

COLUMBUS, INDIANA

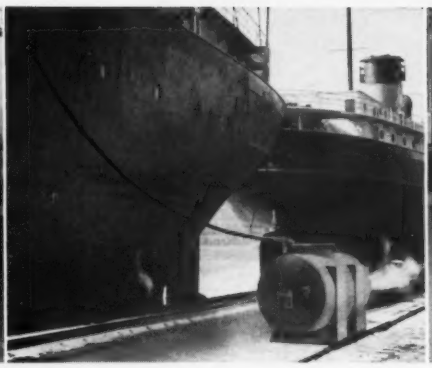
DIVISION OF

RELIANCE ELECTRIC AND ENGINEERING CO.

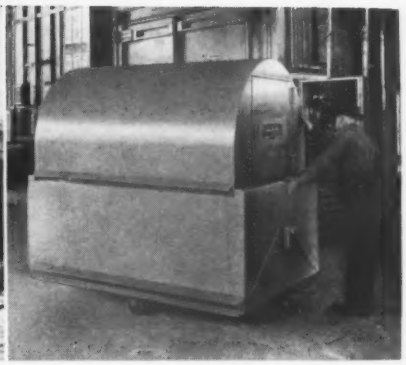
Here's *MASS-HANDLING* of bulk

What you see above is a Dempster-Dumpster serving one of its detachable containers. Multiply this simple pick up, haul and dump operation by scores of steel containers built to meet your requirements for handling waste or salvable materials, raw and finished products, fluids including acids, combustibles, dusty materials, etc. You have, then, mass-handling of bulk materials with one truck and one man!

Tilt Type Container is handling filter dirt at a plant in Illinois. Note container is equipped with casters and placed under chute, through which the filter dirt passes directly from presses. As each container is filled, it is replaced with an empty one.



Tank Type Container is being filled with used oil from a ship. Time required to haul loaded container to reclaim station, drain and return for refilling—10 minutes. Time cycle of the former method using conventional barrels—60 minutes.

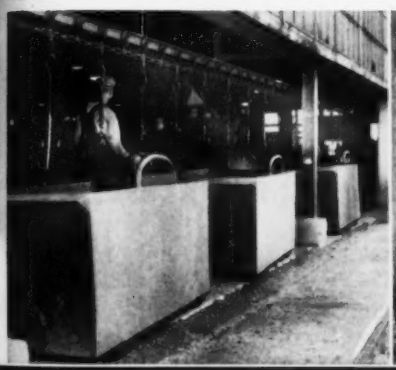


A loaded Apartment Type Container, equipped with roller bearing casters, is being rolled to outside of this plant building. Dempster-Dumpster will pick it up, haul to disposal area, dump the refuse and return empty container for refilling.

Three heavy duty Drop Bottom Type Containers, shown below, are loaded with cast iron fittings from conveyor at plant in Birmingham. Dempster-Dumpster picks up each container when loaded and hauls the finished products to shipping department.

Here's another example of the many types of waste materials handled by this system. The Skip Type Container shown below is located under hydropulper at a paper plant. Picture was shot while container was being filled with rope waste sludge.

Waste materials are loaded into these Universal Containers at a food plant warehouse. Containers have lids in top, as well as a door in each end, which are opened to make deposits, then closed, sealing materials in container.



k materials with one truck...one man!

A FEW OF THE HUNDREDS of containers available are shown above in actual service. They are built in capacities up to 21 cu. yds.—several times the capacity of the average dump truck body. One Dempster-Dumpster, operated by only one man, the driver, serves scores of big detachable containers, one after another—handling materials of every description. It's like having one truck with scores of bodies!

Records of performance in dozens of installations prove beyond question that savings are tremendous! The Dempster-Dumpster System cuts costs of equipment and operation. It is common knowledge that one Dempster-Dumpster will perform the work of several conventional trucks, reducing investment accordingly. This system eliminates standing idle time and re-handling of materials. Once placed in these containers, materials remain there until hauled to destination. Efficiency, sanitation and good plantkeeping are big advantages. Materials to be transferred or disposed of are constantly being placed in the containers as they accumulate. Containers for handling refuse are fire-proof, rat-proof and scavenger proof.

With no obligation on your part, our engineers will be glad to make a comprehensive fact-finding survey to determine the cost-cutting possibilities of this equipment in your plant. Write us for complete information today! Manufactured exclusively by Dempster Brothers, Inc.

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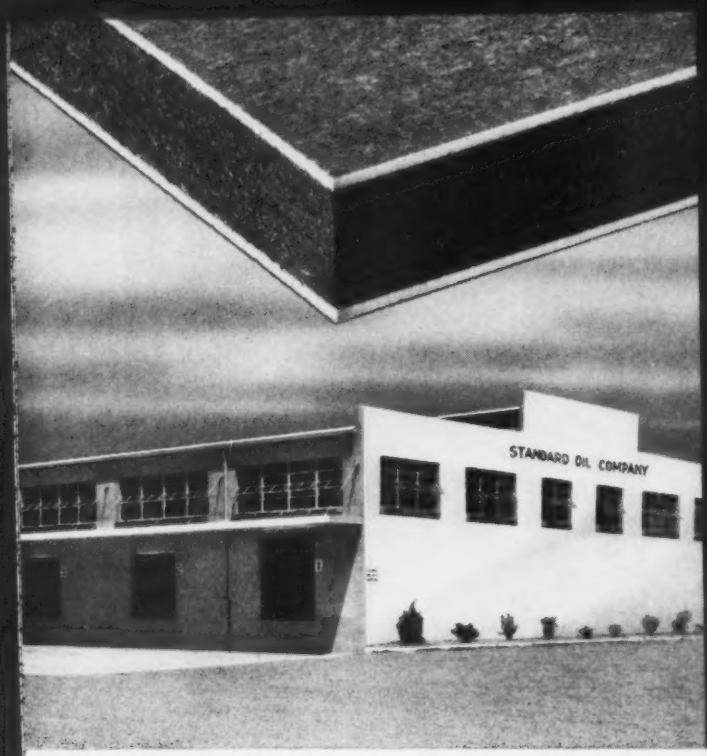
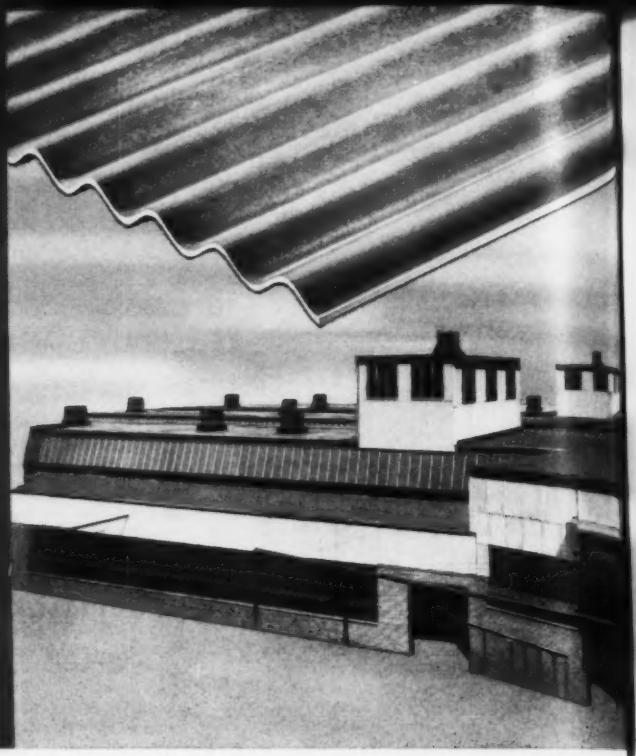


One material — Carey Thermo-Bord structural insulation panels —does work of three at this Standard Oil Co. (Ky.) warehouse. Combines roof deck, insulation and interior ceiling finish.



Ease and speed of erecting exterior sidewalls of **Careystone Corrugated** helped Superior Foundry Company, Cleveland, Ohio build new 60,000 sq. ft. plant in six weeks — economically!

2 ways out of the building cost squeeze

As long as cost is a major problem in construction of new buildings and modernization of old ones, the search for more economical methods and materials will go on. In many cases, however, it ends when Careystone Corrugated and Carey Thermo-Bord come on the scene. Careystone Corrugated has numerous advantages for exterior sidewalls and roofing. It is economical in cost; easy to apply over wood or steel framing; strong and rigid. Made of asbestos and cement, it is practically indestructible . . . won't burn, rust, rot, corrode. No painting or preservative treatment is ever needed.

Great savings in material and labor can be made by using Carey Thermo-Bord 4′ x 12′ Structural Insulating Panels for roof deck construction. Thermo-Bord combines structural deck, insulation and interior ceiling finish in one rigid unit. And its light weight means lighter-weight structural members can be used to gain *more* dollar savings. Made by bonding tough asbestos-cement board to a specially processed insulation core, Thermo-Bord is also recommended for low-cost insulated outside walls and partitions.

Get the facts on these Carey cost-savers. Write for free descriptive literature today. Or, ask your Carey Industrial Sales Engineer to pay you a visit. Address Dep't. WI-5.

Carey

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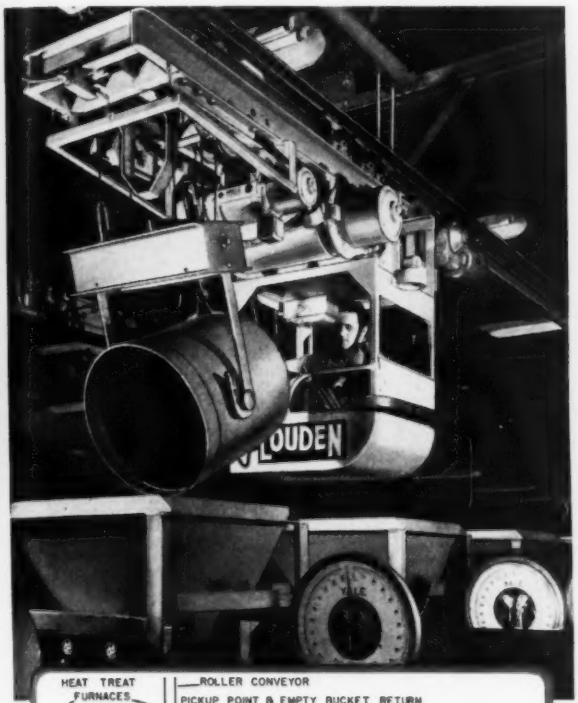
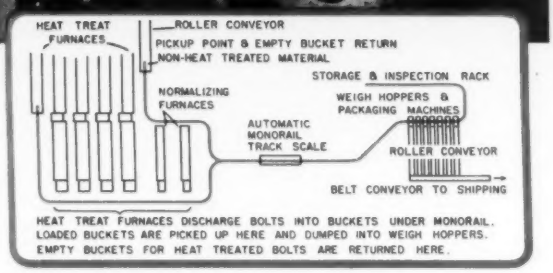
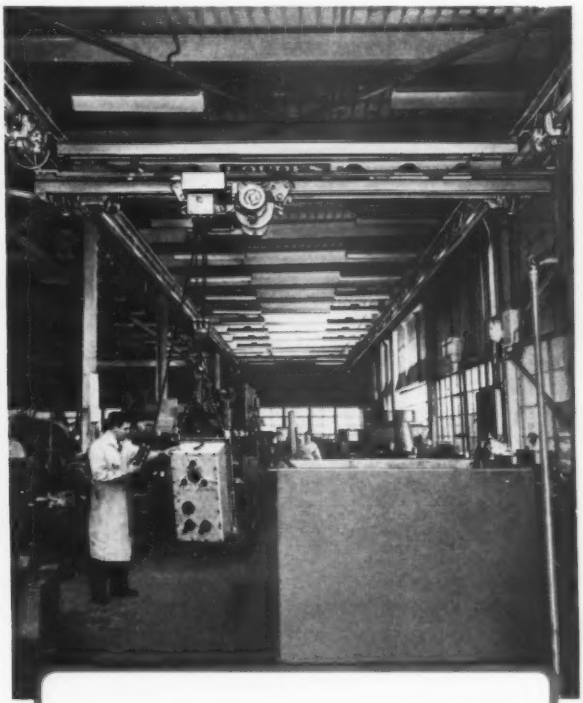
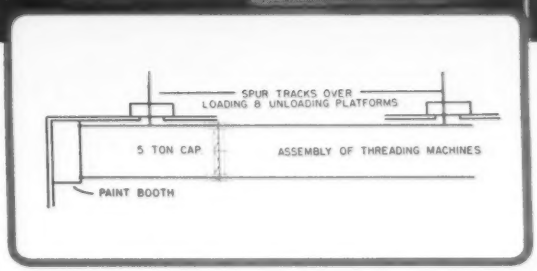
Parts for packaging or components for assembly?




HEAT TREAT FURNACES
ROLLER CONVEYOR
PICKUP POINT & EMPTY BUCKET RETURN
NON-HEAT TREATED MATERIAL
STORAGE & INSPECTION RACK
NORMALIZING FURNACES
WEIGH HOPPERS & PACKAGING MACHINES
AUTOMATIC MONORAIL TRACK SCALE
ROLLER CONVEYOR
BELT CONVEYOR TO SHIPPING
HEAT TREAT FURNACES DISCHARGE BOLTS INTO BUCKETS UNDER MONORAIL. LOADED BUCKETS ARE PICKED UP HERE AND DUMPED INTO WEIGH HOPPERS. EMPTY BUCKETS FOR HEAT TREATED BOLTS ARE RETURNED HERE.





Louden engineered overhead handling speeds and saves in many ways

Many plant executives have found a broad avenue to savings and production increases in Louden engineered Monorail and Crane systems . . . products of the longest overhead handling experience.

Above, left, a Louden cab-controlled carrier conveys heat-treated parts from furnaces to packaging machine hoppers. With handling overhead, furnaces are grouped closer together. Rehandling is eliminated. Machine non-productive time is cut. Much the same is true of the installation shown at the right where a Louden 5-ton crane is handling a component for final assembly in a screw thread machine factory.

Let Louden's long experience and complete line of equipment bring you the best solution to your handling problems.

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Louden
MONORAIL & CRANES

Western Industry

EDITORIALS

Your money and mine

QUITE RECENTLY it was brought to our attention that some $30,000,000 of the taxpayers' money (yours and mine) went down the drain in the last couple of years in one of the missile programs before any of the various contractors learned how to do the job successfully. (Incidentally, our young and supposedly inexperienced Western companies compared very favorably with older and assumed-to-be more skillful Eastern concerns.)

Whether this loss was avoidable probably will never come to light unless some Congressional committee penetrates the security barrier that keeps mistakes, as well as secret equipment and processes, out of sight. But the point is not "who was responsible?" but "how can we lessen the danger of waste in all ramifications of our far-flung federal operations?"

The best way today is to get the recommendations of the Hoover Commission enacted into law. Its reports and recommendations represent more than a year of painstaking work of several committees appointed by this commission, which has former president Herbert Hoover as its head.

Each task force, made up of eminent men who are familiar with the fields examined, has made careful examination of the business management side of government, determined how and where huge dollar wastes can be eliminated through better business methods and greater efficiency in governmental operations. Now their recommendations are being submitted to the Congress for action.

But if Congress fails to act on the recommendations through enactment of the necessary legislation, potential savings into the billions of dollars will not be made. And if billions cannot be lopped off the expenses of operating the Government, it will be futile to hope for substantial reductions in taxes or, for that matter, the holding of taxes down even to present levels.

The time has come, therefore, for John Q. Public (i.e., you and me) to take pen in hand and communicate to his congressman and his two senators. Only by the expression of public opinion, through individual communications to the members of Congress, can the public accomplish the tax reductions that can only come from sounder business management in Government.

Unworked gold mines

"CALLING IN business consultants has become standard practice and, if we would benefit, we must accept and put into practice their recommendations," writes Frank Drumb, assistant vice president, Crown-Zellerbach Corporation, in the Oregon Business Review, published by the School of Business Administration, University of Oregon. "The bulk of these recommendations, however, are ideas which the consultants gather from our own employees—good ideas which we have refused or neglected to recognize."

Business consultants will probably not agree too much with Mr. Drumb's assertion about the source of their recommendations, but his point that too little attention is paid to the ideas of employees can hardly be disputed. His own company was able to avoid a wage cut in the early stages of the depression by asking for, and obtaining, cooperation in making a $500,000 annual saving by a rigid economy program.

The way we live

ALTHOUGH the large industries of the East and Middle West pretty much set our year-to-year bargaining pattern for us in the West, whether we like it or not, nevertheless this is not too likely to prevail in the drive for security as represented by pension plans and the guaranteed annual wage. So opined James P. Rogers, Portland industrial relations attorney, speaking before the manufacture committee of the Chamber of Commerce of the United States in San Francisco in March.

"Our lumber unions, for example, refused to press for pensions at the time that subject was so 'hot' back East, though some of our lumber employers here were prepared to offer it, and one did. I would suspect that the guaranteed annual wage subject will meet with equal indifference out here for a long time. As before, I expect they will take their gains in cents per hour wage increases."

He attributes this to the stability of our Western labor force, both as to attitude and continuity of employment, which is reflected in their labor representatives. In turn this is created by our conditions: small plants and communities, with workers living in homes surrounded by yards and gardens; no vast industrial establishments employing many thousands of people coming from rows and blocks of identical apartments. Also no great chasms between the organized worker and the executive as exist elsewhere, which tends to put Western labor and management on a sounder basis when dealing with each other.

"All in all, we find labor problems in general less troublesome to us. Left to ourselves, I think we would evolve a much more ideal type of industrial-labor economy than that which seems possible east of the Mississippi."

Perhaps we are on the way to evolving it, more so than we think.

flow-mation*

A GREAT NEW IDEA IN MATERIALS HANDLING

Those who have seen it in action agree—there's nothing like it for cutting production time, reducing handling hours, bringing down operator fatigue. FLOW-MATION* by Powell—the greatest idea in materials handling in the past decade.

Your standard lift truck—no attachments needed—sets a box on a rack . . . it automatically actuates a sliding door, emptying contents into work level hopper. Operator drops finished piece into chute that leads to box below. It's as simple as that—but so was the safety pin.

One unit or a thousand . . . they'll save you handling dollars the moment you set them up. Get your copy of a specially prepared booklet on FLOW-MATION* now. Simply write to your Powell representative or contact Powell direct.

*FLOW-MATION and FLOW-MATIC are trade names of the Powell Pressed Steel Co. —Product Patent Pending.

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the POWELL PRESSED STEEL Co.

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Seattle 4, Washington
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50 years of progress in CONTINUOUS-FLOW CONVEYING

● It was just 50 years ago, in 1905, that the first Mathews Conveyers were designed and built—and applied in a Minnesota warehouse. From that early equipment has evolved some very spectacular continuous-flow conveying systems—indeed, some of the real "show jobs" of the conveying industry.

In these 50 years, Mathews engineers have developed the most complete line of gravity and power conveyers and special conveying machinery to be found anywhere—to serve nearly every class of industry in the United States and Canada.

Whatever is required—standardized conveyer units or a complete system—you'll find that Mathews is your best bet. Three modern plants. Engineering sales offices and standardized conveyer distributors located in most principal cities.

50th Anniversary
MATHEWS CONVEYERS
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MATHEWS CONVEYER COMPANY WEST COAST
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MATHEWS

LETTERS

Contributions to this column from our readers are welcome. Names will be withheld from publication if requested. Unsigned letters will be disregarded.

Refinishing method needed

Editor, WESTERN INDUSTRY:

The January issue had some information about the types of electroplating and methods of application of nickel (page 85). I have several pieces of equipment that will need to be refinished from time to time. This equipment measures about 5 x 7 x 12 in. I am looking for a good method of refinishing these units, at a reasonable cost per unit. Several advertisements I have read that imply their equipment could apply chrome finish with a brush and the use of electricity seem a little "far-fetched." Could your magazine direct this inquiry to a reliable source of information? That will save me the time and effort of having to discover America all over again.

I believe the major cause of the damage to the equipment was using some kinds of detergents to try to clean the surface of a grease film.

LEONARD E. GAINER
Lebanon, Ore.

Automation interest

Editor, WESTERN INDUSTRY:

I am very much interested in the Council of Profit Sharing Industries and that approach to the automation and other management-labor problems.

Would you be so kind as to give me the address or other data on the above Council whereby more conclusive information may be had.

J. T. PARTRICK
Sunland, Calif.

National headquarters of Council of Profit Sharing Industries are in First National Tower, Akron 8, Ohio. West Coast secretary is John C. O'Keefe, 919-D E. California St., Pasadena 5. —Ed.

Information source

Editor, WESTERN INDUSTRY:

I want to compliment you and the staff of WESTERN INDUSTRY on the excellent presentation of timely topics in your magazine which is source of valuable information for us.

H. E. KAMPRATH
American Smelting and Refining Co.
Western Mining Department
Salt Lake City

Externally Upset OSTUCO Tubing

saves 31% on processing improves mandrel life

for Halliburton Oil Well Cementing Company

A savings of 31% over previous manufacturing methods, was made possible by using externally upset OSTUCO Tubing as Wall Packer Mandrels in "Howco" Expanding Shoe Assemblies. These OSTUCO forgings eliminated a welding operation and reduced machining time and cost. One-piece fabrication greatly improved the useful life of the part.

Compare your tubing costs with job-designed OSTUCO Tubing. *Special-quality* OSTUCO Tubing is manufactured to your individual requirements . . . formed to save processing time and waste. Fill all your tubing requirements on *one* order with OSTUCO'S unique *single-source* service. You'll eliminate interplant shipment, reduce error and speed delivery. Wire, write or phone OSTUCO for complete details, or submit blueprints for immediate quotation.

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—Fabricating and Forging

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Birthplace of the Seamless Steel Tube Industry in America
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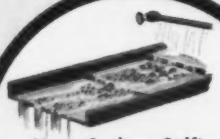
Maas SODIUM SULFITE

Serves many industries BETTER

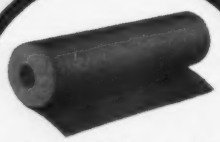
Maas Sodium Sulfite is widely used in boiler water treatment.



Maas Sodium Sulfite is an excellent selective depressant in ore flotation.

Maas Sodium Sulfite helps natural and synthetic rubber reclaimers.

Maas Sodium Sulfite helps food processors with quality control.



Maas Sodium Sulfite helps make better paper.

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Sodium phosphates—Ammonium phosphates—Calcium phosphates (Food grade and stock feed grades)—Potassium phosphates—Phosphoric acid—Surface active agents—Oxalic acid—Oxalates—Formic acid—Formates—Acetic acid—Sodium hyposulfite—Sodium sulfite—Sodium carbonate—Triethanolamine phosphate—a full range of photo pure chemicals—and many more.

CALENDAR OF MEETINGS

MAY 15-20—*National Tank Truck Carriers* conference, Mark Hopkins and Huntington Hotels, San Francisco. Contact C. Austin Sutherland, managing director, 1424 Sixteenth St. N.W., Washington 6, D. C.

MAY 16-17—*Utah Liquefied Petroleum Gas Assoc.*, annual convention and trade show, Newhouse Hotel, Salt Lake City, Utah. Contact LPGA, Inc., 11 S. La Salle St., Chicago 3.

MAY 17-19—*Association of American Railroads (Communications Section)*, St. Francis and Sir Francis Drake Hotels, San Francisco. Contact A. H. Grothmann, secretary, 59 E. Van Buren St., Chicago 5.

MAY 22-27—*Mass Spectrometry*, committee meeting of American Society for Testing Materials, Mark Hopkins Hotel, San Francisco. Contact offices of Society, 1916 Race St., Philadelphia 3, Pa.

MAY 26-27—*Electronic Components Conference*, Los Angeles. Contact Dr. Simon Ramo, Ramo-Woldridge Co., 8820 Bellance Ave., Los Angeles 45.

JUNE 6-9—*National Industrial Service Assoc.*, Hotel Statler, Los Angeles. Contact Horace Barks, NISA headquarters, 818 Olive St., St. Louis 1, Mo.

JUNE 15-17—*American Society of Training Directors*, annual convention, Ambassador Hotel, Los Angeles. Contact Ralph E. Wohlford, Publicity Committee, 15104 El Soneto Dr., Whittier, Calif.

JUNE 19-22—*American Industrial Bankers Assoc.* conference, Fairmont Hotel, San Francisco. Contact Myron R. Bone, vice president, 1208 Lincoln Bank Tower, Fort Wayne 2, Ind.

JUNE 19—JULY 1—*Series of one-week management conferences*, Industrial Relations Section, California Institute of Technology, Pasadena, Calif. Contact Robert D. Gray, Director, Industrial Relations Section, CIT.

JUNE 20-23—*Forest Products Research Society* national convention, Seattle.

JUNE 26-29—*American Society of Heating and Air Conditioning Engineers*, St. Francis Hotel, San Francisco. Contact A. V. Hutchinson, Executive Secretary, 62 Worth St., New York 13.

JUNE 27-28—*Wyoming Liquefied Petroleum Gas Assoc.*, annual convention, Hotel Townsend, Casper, Wyo. Contact LPGA, Inc., 11 S. LaSalle St., Chicago 3.

JULY 12-14—*Second Western Plant Maintenance and Engineering Show and Conference*, Pan-Pacific Auditorium, Los Angeles. Contact Clapp & Poliak, Inc., 759 Monadnock Bldg., San Francisco.

. . . More on page 22

Mechanized Freight Docks Keep Freight Moving

Mechanized freight docks at Consolidated Freightways terminals were designed with your shipments in mind. They keep your freight separate and keep it moving... result in faster transfer of cargoes from city pick-up trucks to over-the-road equipment, less handling, surer checking.

Consolidated Freightways has more mechanized freight docks like the above than any other carrier, an added CF service of direct benefit to you—and your customers.

One more reason to rely on Consolidated Freightways, America's finest *complete* motor freight service.

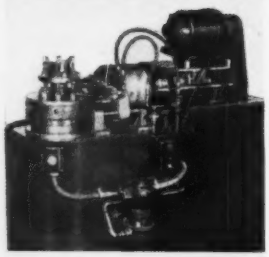
SEATTLE • PORTLAND • SAN FRANCISCO - OAKLAND • LOS ANGELES • SPOKANE • SALT LAKE CITY • MINNEAPOLIS - ST. PAUL • CHICAGO

Terminals in 49 other key cities from the Pacific Coast to the Great Lakes... Thru service to all major eastern cities

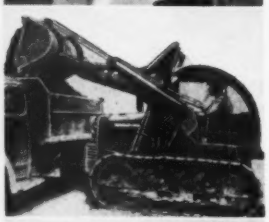
Why...Do GOODALL HOSE ASSEMBLIES *Stand Up Longer?*

There are two reasons for the exceptionally long life of efficiency and safety provided by Goodall Hydraulic Hose Assemblies:

THE HOSE. Goodall Hydraulic Hose has been perfected to meet the highest standards for this service. Construction consists of oil-resistant Synplastic® tube; multiple-braid steel wire carcass; oil-, weather-, and wear-resistant Synplastic® cover. The result is an exceptionally strong, tough durable hose that withstands continuous flexing . . . the ultimate in quality and safety.



THE COUPLINGS. The Couplings used on Goodall Hose Assemblies have proven to be unequalled for strength and holding power among fittings of their type. Cross-section shows how these super-strong couplings are virtually MOLDED TO THE HOSE . . . locked in by a three-way gripping arrangement that precludes all possibility of the couplings pulling away or blowing out under highest working pressures. Furthermore, the design of the couplings actually PROTECTS THE HOSE at its most vulnerable point under flexing . . . immediately back of the coupling. Couplings are regularly furnished in steel or malleable iron, depending on size, and thoroughly rust-proofed.



Attachable to all types of hose

These couplings will give the same efficient service on other types of hose as on wire braid hydraulic hose-rayon or cotton braid, wrapped ply, cotton covered, etc.

★ ★ ★

Use Goodall Hose Assemblies for your next new or replacement job. Our nearest branch is equipped to give prompt delivery on these, and on other types of hose with couplings attached.

Contact Our Nearest Branch for Further Details and Prices

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CALENDAR

. . . Begins on page 20

JULY 25-29—*14th Annual Stanford Business Conference*, Stanford University, Calif. Contact Dean J. Hugh Jackson, Graduate School of Business, Stanford University, Stanford, Calif.

AUG. 24-26—*Western Electronic Show and Convention*, Civic Auditorium and Fairmont Hotel, San Francisco. Contact Mal Mobley Jr., Business Manager, 344 North La Brea Ave., Los Angeles 36.

AUG. 28-30—*Liquefied Petroleum Gas Assoc.*, District 2 convention and trade show, Sheraton-Palace Hotel, San Francisco. Contact LPGA, Inc., 11 S. LaSalle St., Chicago 3.

SEPT. 12-16—*Instrument Society of America*, 10th annual conference and exhibit, Shrine Exposition Hall and Auditorium, Los Angeles. Contact Fred J. Tabery, Fred J. Tabery Corp., 3443 S. Hill St., Los Angeles 7.

SEPT. 16-22—*American Society for Testing Materials*, Pacific Coast Meeting, Hotel Statler, Los Angeles. Contact offices of Society, 1916 Race St., Philadelphia 3, Pa.

SEPT. 25-29—*Master Brewers of America* convention, St. Francis Hotel, San Francisco. Contact Henry Henius, convention chairman, 2601 Newhall St., San Francisco.

OCT. 5-9—*World Plastics Fair and Trade Exposition*, National Guard Armory, Exposition Park, Los Angeles.

OCT. 10-12—*American Mining Congress*, 1955 metal mining and industrial minerals convention, Las Vegas, Nev.

OCT. 12-14—*Gas Appliance Manufacturers Assoc.* annual meeting, Palm Springs.

OCT. 17-19—*American Gas Assoc.-Pacific Coast Gas Assoc.* annual meeting, Los Angeles.

OCT. 18-30—*34th Pacific Coast Management Conference*, Hotel Claremont, Berkeley. Contact Everett Van Every, President, California Personnel Management Assoc., 2180 Milvia St., Berkeley 4, Calif.

OCT. 20-21—*8th Annual Conference of Council of Profit Sharing Industries*, Ambassador Hotel, Los Angeles. Contact John C. O'Keefe, Field Secretary, 919-D E. California St., Pasadena.

OCT. 23-25—*Western Regional Frozen Food Convention*, Hotel Mark Hopkins, San Francisco. Contact Harry Lerner, Executive Secretary, 675 Monadnock Bldg., San Francisco.

OCT. 27-29—*Pacific Northwest Personnel Management Assoc.*, Davenport Hotel, Spokane. Contact Eric Brown, General Conference Chairman, c/o Spokane Chamber of Commerce, or phone RI-5161.

OCT. 30-NOV. 1—*Pacific Northwest Trade Assoc.* fall conference, Seattle, Wash. Contact Association office, Vance Building, Seattle 1.

Standard Engineer's Report

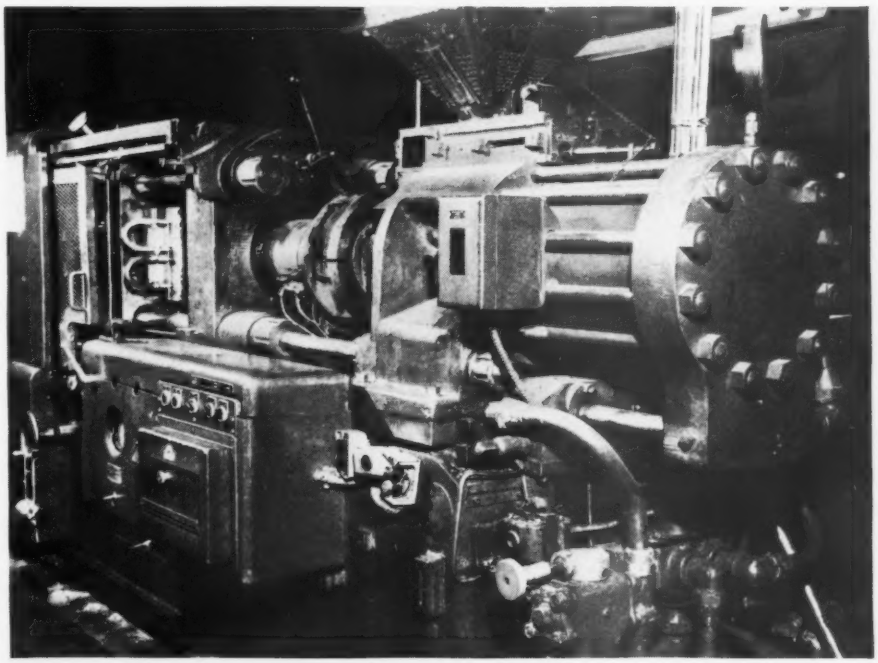
CASE HISTORY

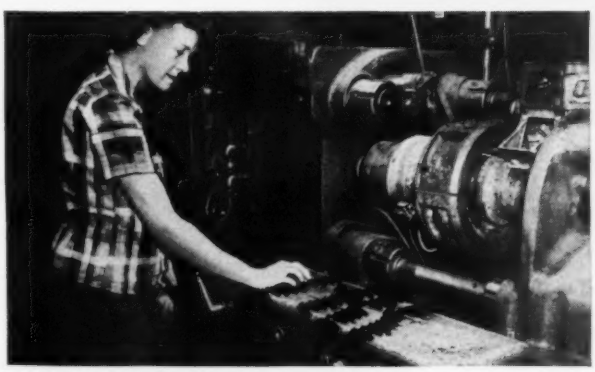
PRODUCT *Calol OC Turbine Oil*

FIRM *Windman Brothers, Los Angeles, Calif.*

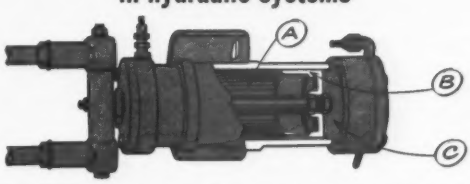
Inhibited oil cuts maintenance costs $1200 a month!

BEFORE USING CALOL OC TURBINE OIL in the hydraulic system of this and 9 other plastic injection-molding machines, Windman Brothers, Los Angeles, shut down an average of 4 machines a month to clean oil deposits from valves. Parts, labor, and downtime cost $1200 a month. Calol OC Turbine Oil stopped this trouble and has eliminated repairs due to lubrication on all of the machines for more than 5 years. The oil stays clean in spite of operating at constant temperature of 135°F. and under 1000 psi pressure, 24 hours a day, seven days a week. The machines make many kinds of plastic objects. Windman Brothers have produced more than 50,000,000 fountain pen parts like those shown below.





How CALOL OC Turbine Oil cuts costs in hydraulic systems



Used as the hydraulic medium in feeds and lifts of any kind, Calol OC Turbine Oil will not form carbon or foam excessively.

A. Contains very effective oxidation inhibitor—will not deteriorate and plug lines and retard action of cylinders.

B. Corrosion inhibitor prevents rusting and pitting—has high metal-wetting ability.

C. Separates readily from water or other contaminants—dirty oil may be reclaimed easily...charge lasts indefinitely, leakage only cause for replacement.

FREE CATALOG: "How to Save Money on Equipment Operation," will be sent on request to Standard Oil Company of California, 225 Bush St., San Francisco.

FOR EXPERT HELP on lubrication or fuel problems, call your Standard Fuel and Lubricant Engineer or Representative, or write to 225 Bush Street, San Francisco, California.

CALOL

TRADEMARK "CALOL" REG. U.S. PAT. OFF.

STANDARD OIL COMPANY OF CALIFORNIA

THE SIGN OF SUPERIOR SERVICE . . . coast to coast

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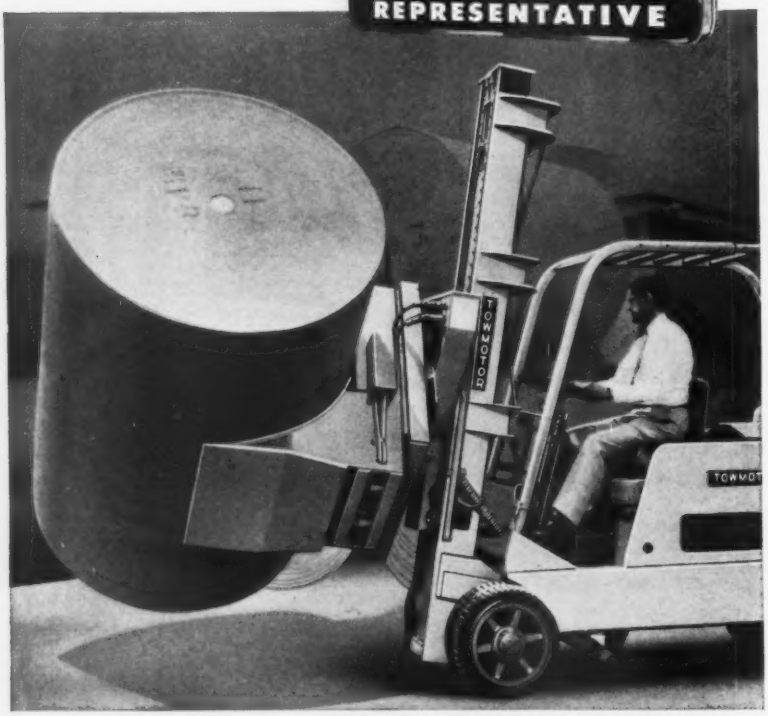
THE ONE-MAN-GANG
FORK LIFT TRUCKS
YOUR TOWMOTOR REPRESENTATIVE



New TOWMOTOR Roll Clamp upending multi-ton paper roll

FAST DEPENDABLE SERVICE

when you need it!

Every Towmotor fork lift truck is designed to stay on the job longer. However, abuse, or years of service eventually make repairs necessary. That is when Towmotor's easy service accessibility pays off. Each Towmotor Representative is a materials handling specialist who backs up the Towmotors he sells with the most efficient and complete service facilities in the field. Talk to him about the advantages of Towmotor 3-way Service. See your Towmotor Representative today, and write for complete service information. TOWMOTOR CORPORATION, DIV. 6705, 1226 E. 152nd St., Cleveland 10, Ohio.

FOR SUPERIOR SERVICE CALL YOUR LOCAL TOWMOTOR *REPRESENTATIVE*

TOWMOTOR FORK LIFT TRUCKS AND TRACTORS SINCE 1919

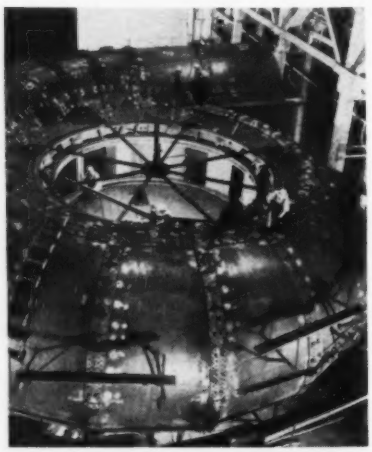
THIS MONTH'S COVER

SCROLL CASES for vertical turbines

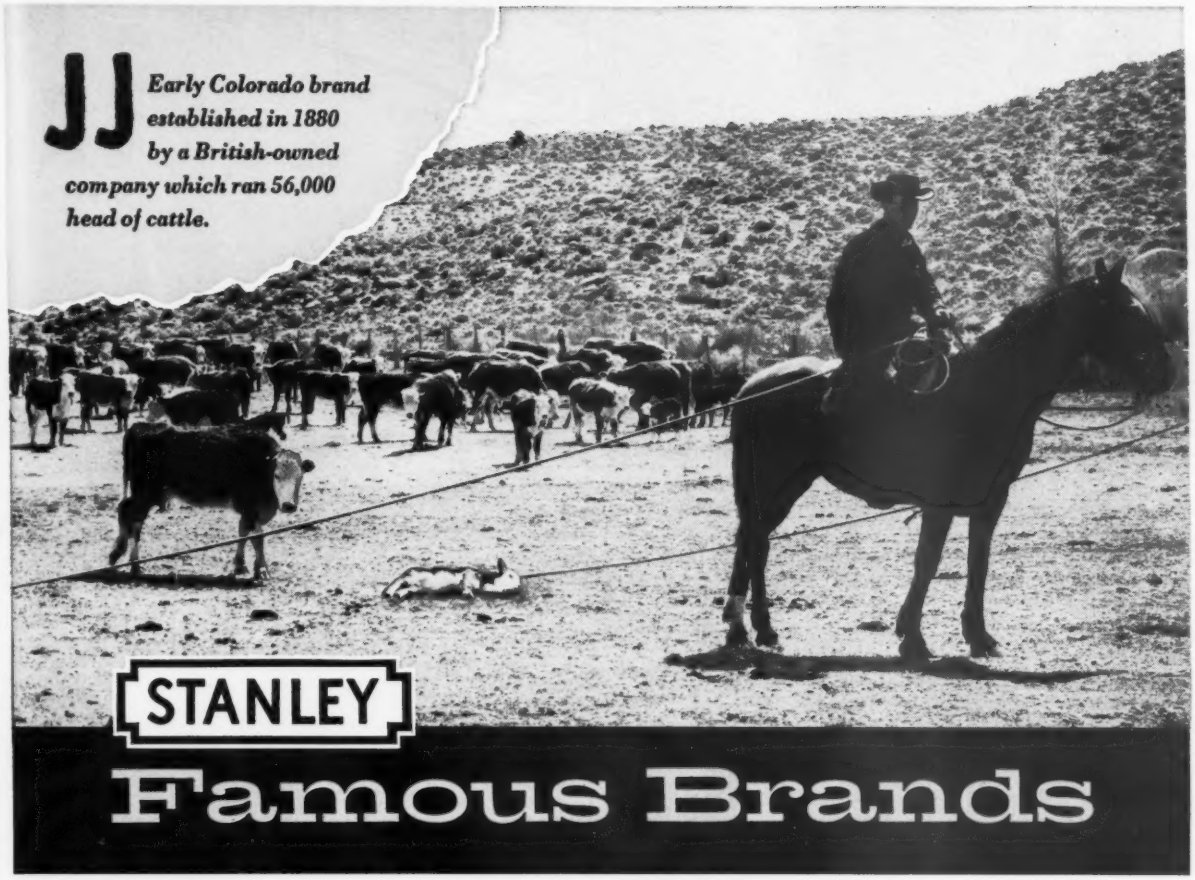
THROUGH these steel scroll cases, shown on our cover and below under fabrication at Willamette Iron and Steel Co., Portland, passes water to turn the vertical turbine units that drive power generators of the West. Water entering hydroelectric plants at high pressure after downward travel through a penstock is directed into scroll cases. A vertical turbine unit is installed in the circular portion of the scroll, where the water pressure on the turbine fins turns it at rapid speed. A vertical shaft from the turbine drives a nearby generator.

Scroll cases require extremely accurate setting during installation. Due to the weights involved (72 tons for example), this is a difficult process requiring special instruments. Once placed in proper position, the ring end of the scroll case is secured by a jack-turnbuckle arrangement which provides a minimum of drift even during the stresses of concrete pouring.

Scroll cases are fabricated in a variety of sizes at Willamette Iron and Steel, as is well illustrated in our cover picture. Almost 50% of the United States energy supplied by water power originates in the West.



VERTICAL turbines to drive the power generators of the West are installed in the circular ends of steel scroll cases. This is the largest of the three shown on this month's cover and fills the full width of Willamette Steel's plate shop bay.


JJ
Early Colorado brand established in 1880 by a British-owned company which ran 56,000 head of cattle.
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Stanley has the reputation throughout the world for the finest, most complete line of hand tools made. Whether your requirements call for such items as planes, levels and screwdrivers or hammers, chisels and soldering irons, the Garrett Supply Company can fill your industrial or hardware tool needs from stock.

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"I need 6000 lbs. of structurals this afternoon--how about it?"

(A true story) It was 4:10 in the afternoon when the purchasing agent of a construction company called his desk man at Ryerson. "I need some structural channels in a hurry—12 inch, 25 pound . . . let's see, 12 pieces—that's 6000 lbs. Can I have it today? I'm really in a jam."

Ryerson's large stocks of ASTM-Spec A-7 structurals included just what was wanted. The steel was immediately cut and loaded, and at 4:35—just 25 minutes after the call—our truck rolled into the construction company's yard. They were then able to fabricate the channels in their own shop and have them in place by 11 P. M.

"I thought of Ryerson because I've always had good service from you," the customer commented later. "I know I was asking a lot, but you really came through for me!"

Whether it's your day-to-day requirements, or help in an emergency—count on Ryerson. Here are the world's largest steel stocks—unsurpassed facilities—and an organization eager and able to deliver. When you need steel—of whatever kind . . . call Ryerson.

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SEATTLE—Plant: 1200 - 4th Ave. Mail: Box 3268, Seattle 14. Phone: SEneca 2300.
SPOKANE—Plant: North 207 Freya St. Mail: Box 2158, Spokane 10. Phone: KEystone 9311.

A close-up look at North American's nuclear reactor

Details of sodium graphite facility at Santa Susana, California

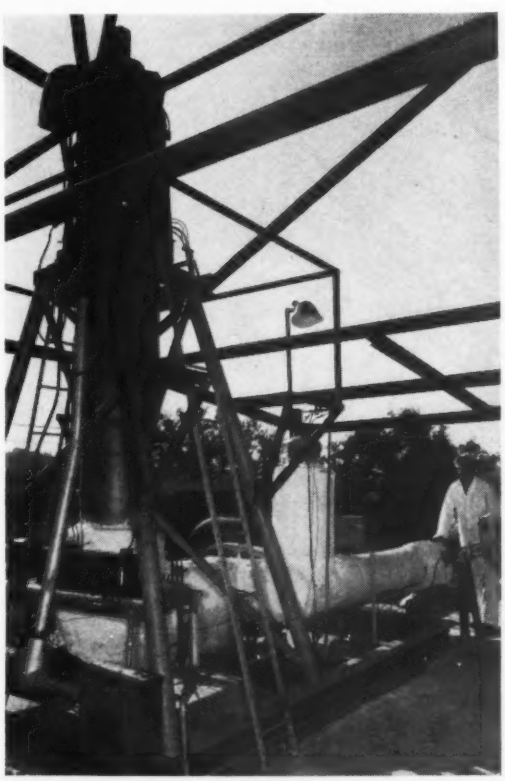
By SIDNEY SIEGEL
Nuclear Engineering
and Manufacturing
North American Aviation, Inc.
Downey, Calif.

OVER a year ago the Atomic Energy Commission undertook development of five reactor types which offer eventual promise for economic nuclear power. One of these five, the Sodium Graphite Reactor, is being jointly developed by the Atomic Energy Commission and North American Aviation, Inc.

The principal experimental facility of the Sodium Graphite Reactor development program is the Sodium Reactor Experiment, construction of which is now proceeding near Santa Susana, Calif. The Sodium Reactor Experiment will develop about 20 MW of heat, which will be rejected to the atmosphere through sodium to air heat exchangers.

Our reactor moderator is graphite, canned in zirconium, in the form of hexagonal columns 10 ft. high, about 1 ft. in diameter. About 100 of these columns make up the core and reflector, a cylinder about 10 ft. in height and diameter.

The metallic uranium fuel elements, enriched to 2.8% U-235, are located in axial fuel channels in the central columns of the moderator stack. The reactive core thus fills a volume about 6 ft. in height and diameter. The core is contained in a stainless steel core tank, closed at the top by means of a concrete shield plug. Liquid sodium, the coolant, enters the core tank at 500 deg F, through a double walled inlet pipe, flows up through the fuel channels from the lower plenum to an upper free surface pool, and leaves the reactor tank at 960 deg. F. The core tank is surrounded by a heavy cast steel thermal shield, and is contained in an outer tank which insures that the sodium level cannot fall below the top of the reactor core in the event of failure of the primary coolant container.



SODIUM pump loop for coolant moves heat to secondary system.

Thermal insulation surrounds the outer tank, which is contained within the concrete foundation and biological shield. The top shield provides the only access into the reactor, and from it are hung the fuel elements, the control and safety rods, and all experimental equipment.

Each graphite moderator column consists of three logs somewhat over 3 ft. long, which fit together to form the 10-ft. high assembly. The zirconium can is formed from zirconium sheet panels which are appropriately bent on power brake equipment. These panels are then trimmed and welded under inert gas atmosphere in an automatic

welding machine. The moderator column is assembled by slipping the zirconium can over the graphite log and welding in the zirconium end plates and the zirconium fuel channel.

The reactor, its coolant system, and its associated facilities will be located in a simple building about 100 x 120 ft. in dimensions. The reactor and the entire primary radioactive coolant system are located below floor level in shielded galleries and vaults.

Secondary system

A mechanical sodium pump, having a capacity of 1,200 gpm., pumps the coolant from the upper pool through a primary heat exchanger in which the heat is transferred to a secondary non-radioactive sodium system. The heat is rejected to the atmosphere from this secondary system in forced draft finned tube heat exchangers and exhaust fans.

A similar auxiliary 1 MW heat exchange system is provided for standby service. In the Sodium Reactor Experiment no provision is made for the generation of electricity or other useful power.

Fuel elements can be inserted into or removed from the reactor by means of a 75-ton shielded cask, supported on a special bridge crane which traverses the entire floor area. By this means irradiated elements can be moved to the cleaning area, to the fuel storage area, or to the subsurface hot cell where the effects of operation upon the physical characteristics of the fuel elements, or other components of the reactor, can be examined.

A full-scale mock-up of the fuel handling cask has been in use for over a year, and information on the performance of the mechanical components, the gas locks, the cleaning system, etc., has been developed. The mock-up of the cask, the fuel channel, and the storage and cleaning cells was erected on a 100-ft. oil-well derrick, which, after necessary alterations, has been a very economical and flexible facility for large tests of this sort.

The main and auxiliary primary coolant systems are common at the reactor. The flow rate through the main system is 485,000 lb. per hour, the sodium entering the reactor at 500 deg. F. and leaving at 960 deg.

The flow rate in the auxiliary system is about 5% of that in the main system. The main pool in the reactor serves as the expansion volume for the primary systems.

Dr. Sidney Siegel
North American
Aviation, Inc.

These two secondary systems are separate from each other, with flow rates similar to their primary counterparts. Expansion tanks are provided in each secondary system. Cold trapping systems are provided in each independent sodium circuit to maintain the coolant purity at acceptable limits.

Tests have already been completed on the type of mechanical centrifugal pump which is to be used in each coolant circuit. This pump has operated satisfactorily for extended periods up to 950 deg. F., and has been tested for short periods up to 1,200 deg.

This pump utilizes a frozen sodium shaft seal in place of the conventional gland seal, and an external frozen sodium casing seal in place of the conventional bolted parting face seal. Extensive test information has been accumulated on the performance of these seals, and indicates that this type of pump will be a successful and economical solution to the problem of pumping liquid sodium.

The reactor facilities are now under construction at the site about 30 miles west of Los Angeles. All excavation work has been completed and the pouring of concrete for the complex substructure galleries and vaults is about to begin. The bottom footing for the reactor core tank has been installed, and the steel core cavity liner is being erected. The iron ore which will be used for the heavy aggregate in special regions of the top shield is on the site.

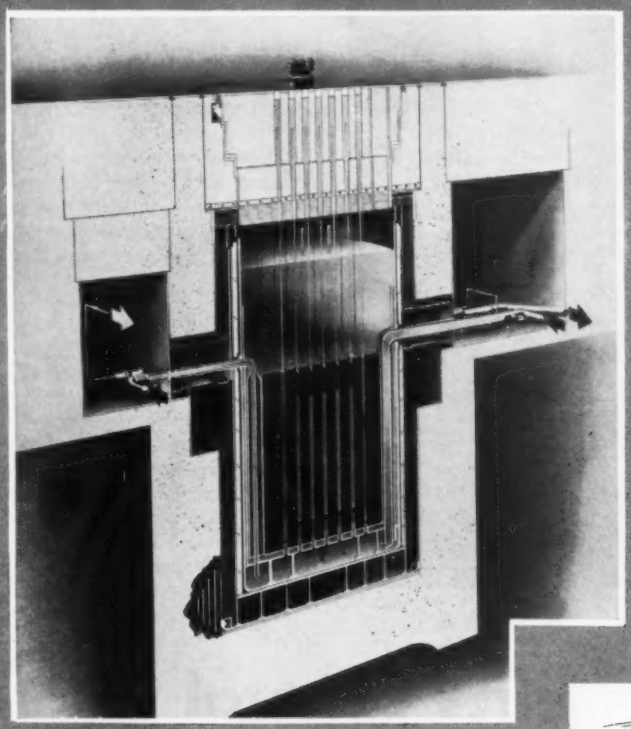
Fabrication under way

Fabrication of most of the major components of the reactor complex is now in progress. The various core tanks are being fabricated in shops in the Los Angeles area and the intermediate and forced air heat exchangers are being constructed by American Locomotive Co. The more special components, such as the fuel elements, the control and safety rods, and the moderator cans are being constructed in North American Aviation shops.

It is expected that assembly of the reactor will be actively under way by June; in the interim an extensive welding training and inspection program has been instituted, based on information developed at other AEC contractor installations and in our own welding development laboratories. It is expected that the reactor construction will be completed by January 1, 1956, at which time preoperational tests and criticality experiments will be undertaken.

With the reactor in operation, problems of fuel element stability and life, the behavior of the reactor core structure under operating conditions, and the performance of components of the heat transfer system will be investigated during the next several years. We expect then to design an economic nuclear power plant.

MOCK-UP of cask, fuel, and storage and cleaning cells was erected on an altered 100-ft. oil well derrick.

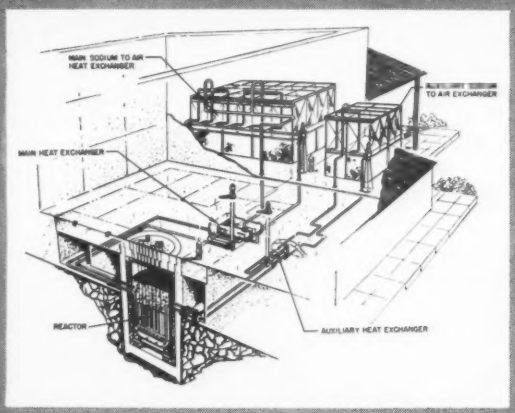


Now: fabricating parts

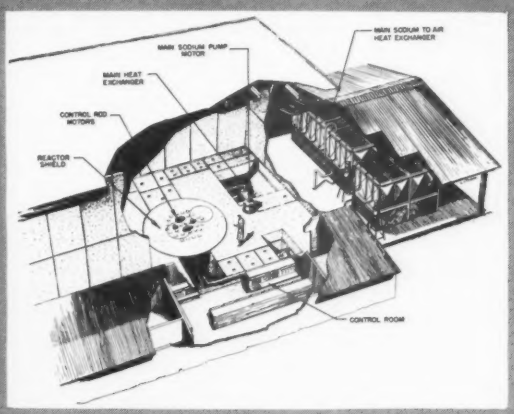
Next month: assembly

January: completion

A MECHANICAL sodium pump (diagramed above) pumps coolant from the upper pool through a primary heat exchanger, where the heat is transferred to a secondary non-radioactive sodium system and then into the atmosphere through exhaust fans.



ARTISTS' conceptions of the completed reactor (pictures at right) illustrate locations of its components. The sodium reactor will be used to conduct special studies in development work towards eventual production of electricity from atomic energy.



SPECIAL equipment improved the testing of signaling units for carrier systems at Lenkurt Electric Co. Equipment was designed after quality control study revealed its need.

How a quality control department can help

Giving it independent status enables it to assist entire factory

By WALTER F. DIMMICK
Manager, Quality Control Dept.
Lenkurt Electric Co.
San Carlos, Calif.

WHEN volume production of a new line of Lenkurt miniaturized telephone carrier equipment was begun in 1954, its complexity and small size accentuated the quality control problem to the point where this function could no longer be adequately carried on under the production engineering department.

Consequently, a quality control department was set up and the quality control program expanded to cover all factory operations, in order better to cope with the more difficult problems associated with miniaturized equipment.

Telephone carrier equipment is an assembly of electronic components enabling a telephone company to send many messages simultaneously over one pair of wires or other transmission medium. The equipment required to send such messages over long distances, sort them out, and convert them into intelligible speech is, of necessity, very complex. In many telephone offices, floor space is at such a premium that it is desirable to make this equipment as compact as possible.

Previously, Lenkurt's quality control functions were under the production engineering department and applied mainly to receiving inspection, electrical testing of the product, and maintenance of the electrical test equipment.

Department organization

The new quality control department was not large—only 20 engineers, technicians, and supervisors, in relation to about 500 production people. With a small department, the emphasis was placed on the promotion of quality: training production people to do quality work, providing test methods, procedures, and accurate test equipment for obtaining quality products, measuring and analyzing quality, and making suggestions for the improvement of quality.

The manager of the quality control department reports through the manager of the equipment engineering division to the works manager. The managers of the production departments report through the manager of the manufacturing division to the works manager. Quality control has men assigned to each production department: metal fabrication, filters and components, panels (sub-assemblies) and systems (complete assemblies). Quality control also has a receiving

AUTHOR Dimmick compares new miniaturized carrier system to larger unit formerly used.

inspection section, an instrument maintenance section, and a laboratory for analysis of production problems and for materials testing.

With skilled and experienced men in constant contact with every production department, and having liaison with every other department in the company, the quality control department has the means for detecting troubles at the earliest possible stage in production. Quality control people can work out solutions to problems with the production supervisors, or they can refer the problem to the department that can provide a solution.

Special test equipment

One of the areas where quality control provides a great service to production is in determining where special test equipment and test jigs can be used to facilitate production or improve quality.

One such item of special test equipment was an automatic cold checker designed by a quality control engineer. It was an elaborate device having an automatic stepping switch, many relays, hundreds of feet of wire, and several colored indicator lights. It had an octopus-like adapter cable so it could readily be plugged into a piece of equipment being tested. The automatic tester could locate possible errors in 250 circuits. It reduced two hours of laborious and sometimes erroneous continuity tests to several minutes of accurate, automatic tests.

By the use of this instrument the quality of the products tested was improved and production time was saved. The production department then applied the time saved by the use of this device to a more thorough mechanical-visual inspection of the production items.

Accurate calibration

Calibrating test instruments and maintaining them to sufficient accuracy for production testing is another important phase of quality control responsibility.

At one time, quality control charts showed that a certain group of electrical filters being constructed had a high defect rate. The production people said they could not make better filters with the available test equipment, since they could not read the electrical test meters any closer.

To improve the condition, the quality control instrument section designed special scales for the test meters, placing the most-used scales at the top and widest part of the meter for easier reading. The number of scale divisions was increased. The meter manufacturer was contacted and he agreed to provide these special meter scales at a nominal cost. The instrument shop installed the new scales and calibrated the meters more accurately to take advantage of the larger scales.

For a small fraction of the original cost of the test meter, it was improved and made more valuable for production requirements. Not only was the number of defective filters and consequent repair reduced, but the quality of all filters was increased.

The receiving inspection section inspects about 200 shipments a week, and the variety of parts inspected in an electronics factory is far greater than in an automobile factory. To accomplish this tremendous inspection task, statistical sampling inspection per MIL-STD-105A, "Sampling Procedures and Tables of Inspection by Attributes," is used. Shipments are accepted, rejected, or accepted on a non-conformance basis according to the inspection and tests performed on a small percentage sample.

A shipment of several hundred powdered iron toroidal cores was received. According to standard practice, a small percentage sample was taken to the quality control laboratory for test. One thousand turns of wire were wound on each coil and given electrical tests to determine if the toroidal cores were adequate for use in Lenkurt's precision filters.

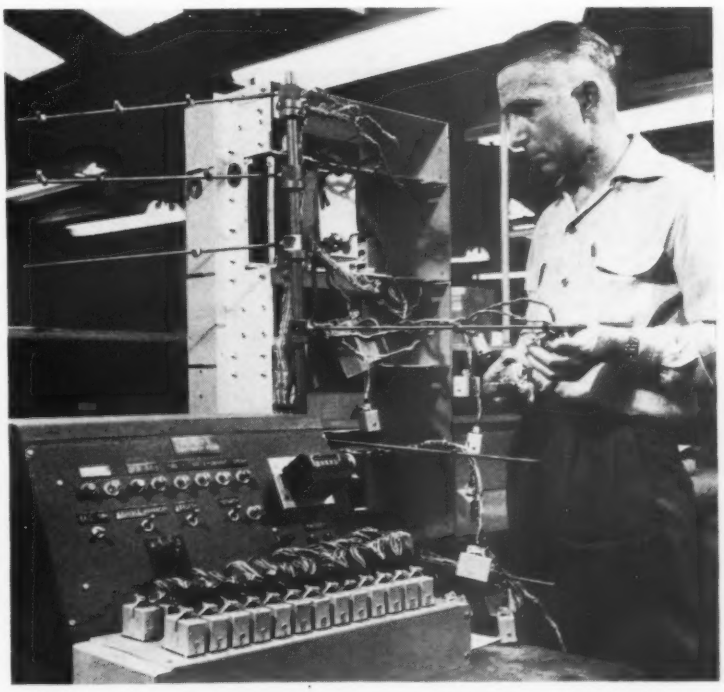
The sample test indicated that as many as 20% of the entire batch were a different type of core than the manufacturer's label showed. Two types of cores had been mixed at the core factory, so many cores had been mislabeled. The job of sorting out the usable cores would have been very time-consuming, so the entire batch of cores was returned to the supplier for replacement.

If it were not for the vigilance of quality control receiving inspection, these mislabeled cores would have been used in production filters, causing costly trouble-shooting and rejects.

Help industrial engineers

Telephone carrier equipment is sent to all parts of the world and must meet rigorous climatic conditions. In Florida the equipment is installed in small concrete huts that are hot and humid. In the Near East, the equipment must stand hot, dry desert climate. In Alaska, Canada, and the northern United States the equipment is subjected to high humidity and sometimes extreme cold.

To help the equipment withstand these extremes of climate, many of the electronic parts are hermetically sealed in metal cans. After the cans are sealed with solder, each one is given a hermetic seal test by immersion in hot water. The hot water heats the air inside the can, increasing the air-pressure and causing bubbles to come



DESIGNED by a Lenkurt Electric Co. quality control engineer, this automatic cold checker reduced two hours of miniaturized carrier equipment tests to a matter of several minutes.

out of any holes in the hermetic seal. The cans are removed from the water before any water enters the holes, the location of the holes is marked, and the cans are repaired and retested.

A quality control engineer, noting the number of sealed cans requiring resealing, decided that the method of solder sealing could probably be improved. The problem was referred to the industrial engineering department, which worked out a better and easier method of sealing the units. Then Industrial Engineering worked with the training department and quality control to instruct the production people in the new method of sealing cans. Production time was cut in half, the appearance of the hermetically sealed components was improved, and the number of defective units dropped to almost zero.

Help development engineers

If Quality Control detects a problem that is determined to be a defect in the quality of design rather than a defect in conformance to the design, the problem is referred to the development engineering department.

All newly designed equipment is subjected to climatic tests to see if operation is satisfactory over a wide range of temperatures and humidity. Units are tested in heat chambers at 160 deg. F., and in cold chambers at 40 deg. below zero. All equipment is tested in humidity chambers, and equipment that is intended for outdoor use is given a salt spray corrosion test.

A newly designed carrier supply generator was being temperature-tested by a quality control engineer. During the high temperature test it drifted out of normal operational tolerance. The quality control engineer determined that the problem was caused by some germanium diodes in the circuit changing their electrical characteristics at elevated temperatures. Since this was a defect in the quality of design of the equipment, the problem was referred to the development engineering department. The problem was solved by replacing the germanium diodes with more expensive silicon diodes that are less sensitive to high temperature.

Cooperating with Sales

The Lenkurt sales engineers are the quality control engineers' contact with the customer. Sales engineers see the equipment in use and note where improvements could be made. They also get suggestions from the customer on how the equipment could better serve his needs.

A sales engineer watching some equipment being unpacked in a northern state noted some loose screws in the bottom of the crate. The screws had fallen out of the equipment during shipment. The sales engineers report all such observations to Quality Control so corrective action can be taken.

Upon investigation, it was found that some of the production women could not put the screws in tight enough with ordinary screw drivers. The women were supplied with large handle torque screw drivers to insure uniform and adequate torque on the screws and to provide a constant reminder that all screws should be tight. This change cost very little and there have been no reports recently of loose screws.

Working with Purchasing

The quality control department maintains a materials testing laboratory for the testing and evaluation of parts or materials that are new to Lenkurt.

There are several reasons for testing and evaluating new items purchased from other companies for use in our equipment. If development engineers are using a new component in a newly designed piece of equipment, they may want performance data under various climatic conditions, or they may want electrical and mechanical test data on the new component.

If there is only one supplier of a certain item used in production, it is important to locate a second supplier and test his product for compliance with the purchase specification. Thus, if the first supplier has a strike or other production troubles, a second supplier is already approved.

It also is important to locate lower cost items having as good quality as the items presently used.

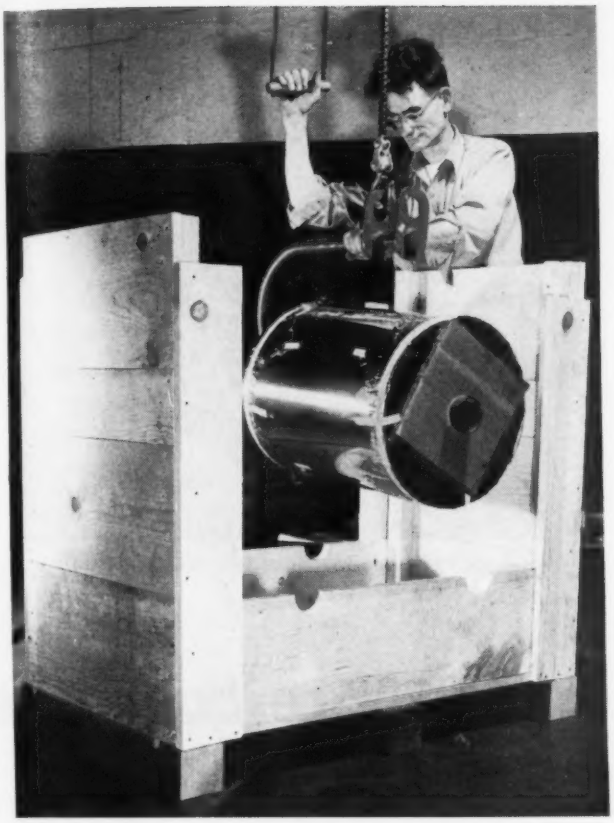
When a buyer in the purchasing department locates a manufacturer that can supply an item having higher quality or lower price than the item in use, the buyer sends samples of the item to Quality Control with a request for qualification tests. The quality control engineers test the samples and prepare a report on the acceptability of the item.

Items may be subjected to electrical tests, mechanical tests, environmental and life tests, depending upon their intended use. In some cases the quality control engineers can give immediate approval of a substitute item after a visual inspection of the item. This is often done for metal or plastic parts where appearance is the principal criterion for acceptance.

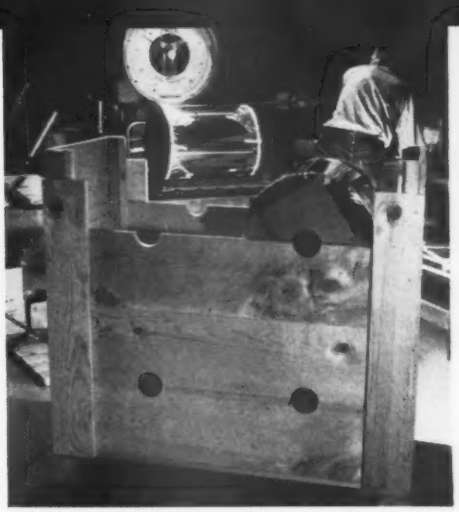
Through tests of varying complexity, such items as relays, vacuum tubes, germanium diodes, insulators, wire, and many other products are evaluated and approved or disapproved for use. During the past year, savings of thousands of dollars have been effected by this material substitution program.

If a technical problem is encountered on the production line, or if something just doesn't look right, a quality control engineer or technician can provide technical assistance.

ACCURACY of test instruments is maintained by Lenkurt's eight-man calibration department.



CORES of the delicate aluminum-foil coils are suspended in split flanges to eliminate damage from contact with the container.



WEIGHED prior to packaging, some coils weigh 1,600 lb.

SHIPPING boxes are built to customer specification.

Aluminum foil

protected through special "float-free" packaging and thwartship loading

ULTRA-THIN aluminum foil produced for industrial and packaging uses requires special protective measures in packaging and shipping to protect the delicate metal from damage. Coils of finer gage foil are packaged at Kaiser Aluminum and Chemical Corp.'s Permanente, Calif., plant so that they "float free" of all contact with their containers.

Steel or aluminum cores of the coils are suspended from split flanges in wooden skids and corrugated cardboard cases. Heavy padding is attached to the cores at each end. These containers are loaded aboard truck vans and railroad cars so that the coils ride sideways; starting and stopping shocks are absorbed by the flanges and danger of coils' telescoping is minimized.

Containers are fabricated to meet the situation presented by each order. Variation of foil width, gage, temper, planned use, and capacity of handling equipment at the customer's plant are considered in package planning on each order.

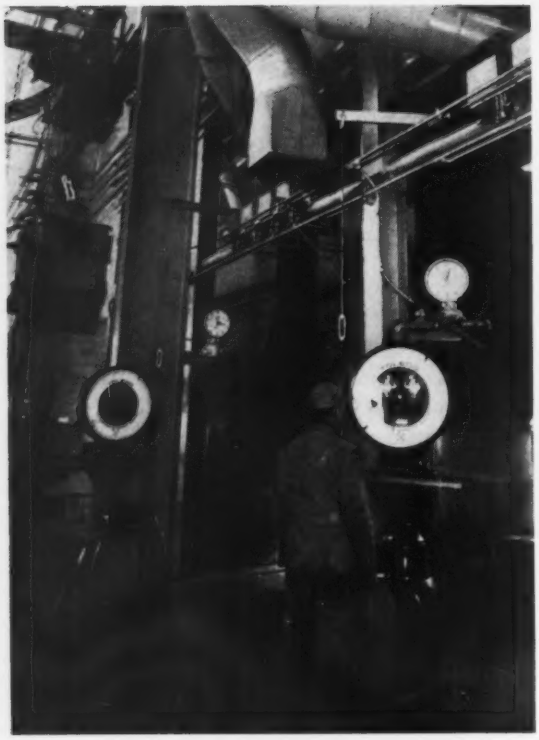
Usually, heavier gage foil such as container stock, .002 in. and above, can be palletized. Pallets are also custom built to fit the capabilities of the customer's handling equipment.

Coils of fine gage foil, ranging from .001 to .00025 in., need more protection than can be provided with pallet-type packaging. These are suspended in wooden skids, either solid side or collapsible type, or corrugated cardboard boxes. Cardboard box packaging is only satisfactory for smaller coils.

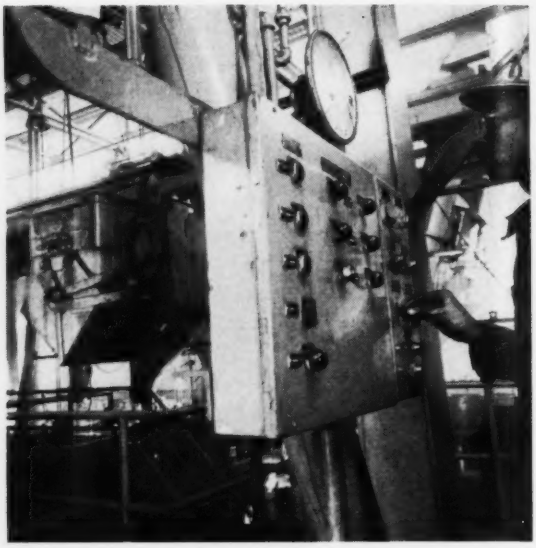
Coils are placed two abreast and one or more deep in the solid side type skid. They may be removed by sling only. The collapsible skids may be dismantled in stages by cutting steel bands and the coils may be removed either by sling or arbors inserted in cores.

The skids are also made to meet the requirements of each order.

Although packaging of the foil is a custom operation for each order, a direct mill-to-package procedure exists at the Kaiser Permanente plant. Flow of the material is streamlined in this way through closely gearing the shipping and receiving departments' operations with the foil processing schedule. A card listing width of foil, gage, outside diameter of coils, and type of core is sent to the box shop as soon as a foil order is ready for its first pass through rolling equipment. The containers are then made to meet the specifications and are ready to receive the finished foil as it comes from the mill. A weekly production planning report to the packaging department further assists in programming activities.

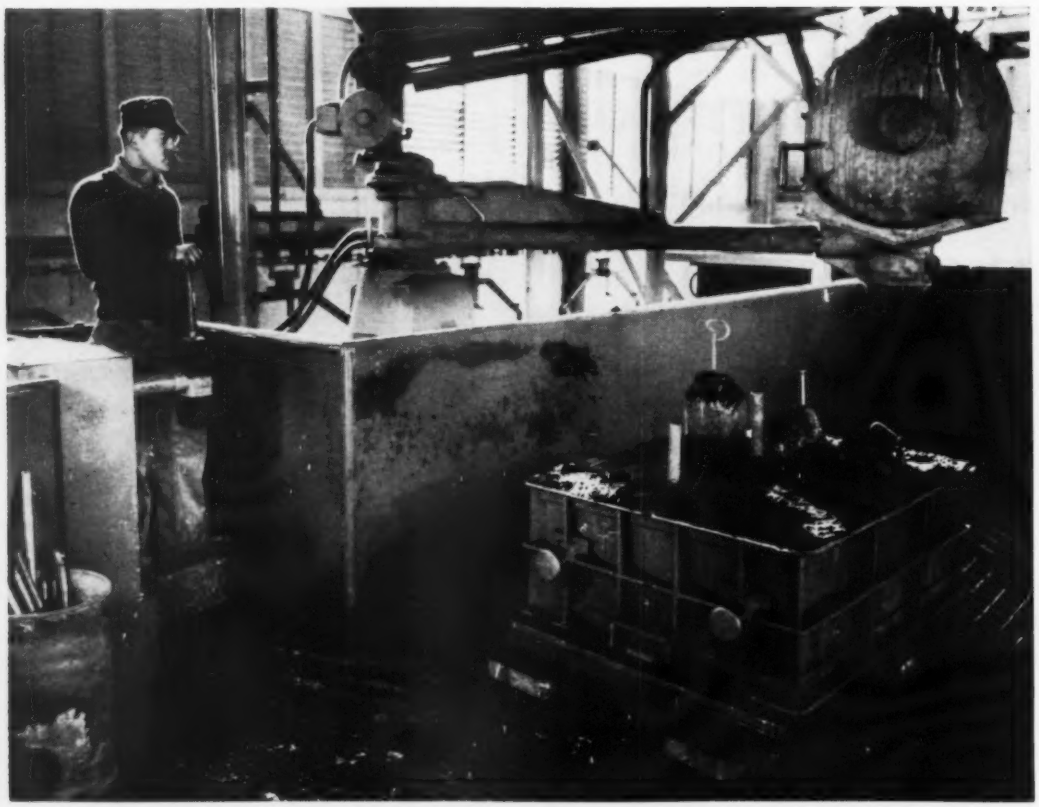


SAND is weighed out and dumped into mullers as needed.

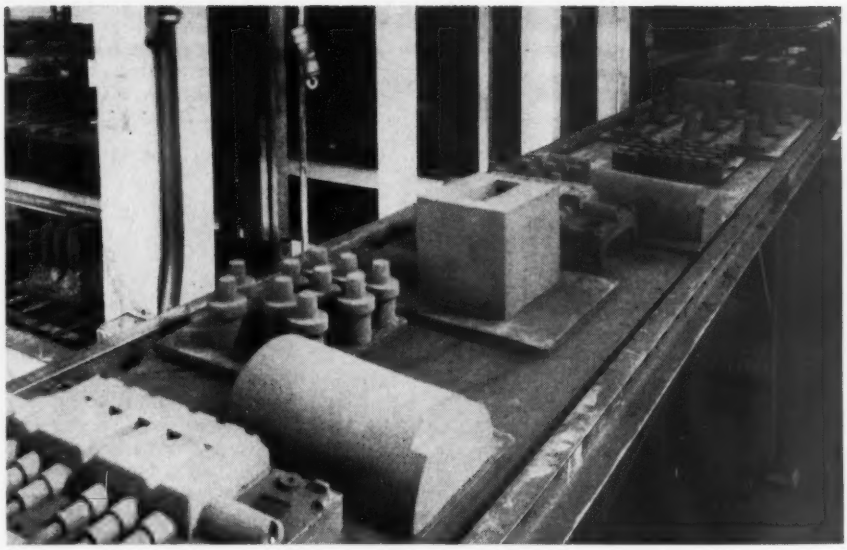


AN OPERATOR directs a monorail bucket to any of 16 points.

More castings b



LARGE molding operations are performed on a 4-position turntable 20 ft. in diameter. Flasks are revolved past a centrifugal force slinger which fills and packs them with sand. They are then roller-conveyed to the pouring room.



SMALL cores are conveyed to an oven operator who places them on pallets and loads oven carriers.

gs by mechanized handling

Sand and metal get a faster ride at new Oakland foundry

MECHANIZED materials handling methods included in General Metals Corp.'s new $5,000,000 foundry in Oakland, Calif., put that company's casting operation on a more advanced production basis. Handling of sand for molds and castings produced in weights varying from 1 lb. to 7 tons, previously handled manually in many cases, has been speeded up throughout the entire operation.

Sand is delivered to the foundry in bottom dump freight cars that release their load within a shelter over the existing rail spur. Dumped through the grated flooring onto a belt conveyor, the sand is carried to a hopper designed to release sand into a turbo drive when maximum weight has been loaded. In the turbo drive, sand is mixed with air at 90 lb. pressure and blown through a 4-in. pipe to a storage bin within the foundry.

This sand storage bin is divided into five sections: three for storage of different types of sands used and two for returned sand. Sand for use is withdrawn at the bottom of the storage bin and transferred to working bins by a bucket elevator and a distribution belt.

Sand additives, fire clay, bentonite, pitch, etc., are stored in eight bins which are serviced by a 1-ton bucket hoist that can, by means of selective switching, empty additives into any one of the eight bins. The additives are withdrawn from the bottom of the bins manually and weighed for use in mulling (mixing) operations.

Mold sand preparation

The working bins are located above three mullers. Each of the three working bins is separated into three sections in which are stored supplies of each type of sand used in molding operations. As needed, the sands are dumped into a weigh bucket located between the bin and the muller. Each type of sand is weighed out in desired quantities and dumped from the weigh bucket into the muller below.

Additives are loaded by hand into mullers through a chute. All of the sand ingredients are mixed with water in the muller and thoroughly mulled. The sand mixture is then conveyed over molding operations where plows can be lowered to contact the conveyor belt and plow sand off into molder hoppers as needed.

A fourth muller, located beside the mold sand mullers, is used for core sand preparation only. The core sand working bin is filled by the same bucket elevator that is used to load the mold sand working bins. Mulled core sand is conveyed into a 1-ton bucket on a monorail and delivered to the core room. By means of selective switching controls located at the core sand muller, an operator can automatically direct the monorail bucket to any one of the 16 core room stations, dump the core sand, and return the bucket to the muller station. Sand is colored as a means of coding for identification.

Core room handling

When small cores have been formed in the core room, they are delivered by a conveyor belt to the baking oven area, where they are placed on pallets and loaded into baking ovens. After baking, the cores are delivered to a finishing process and then taken to molding area by lift truck.

Large cores are crane-lifted on and off an oven car which is electrically propelled on tracks in and out of a large baking oven.

Molding and casting handling

Molding and casting operations are carried out by several different methods due to variations in size and weight of materials to be handled. Flasks for small molds are placed over the pattern, and sand from the hopper is released by the operator into the flask, then packed around the pattern.

After the pattern is withdrawn and

the mold completed, it is lifted by the operator and placed on a small rail car on a turntable. When the rail car is loaded with molds, the turntable is swung into position and the car is pushed out into the pouring area. Here molten iron is poured into the molds from small ladles carried on a monorail system to and from the cupolas.

The next larger size molds are formed by placing the flask around the pattern by crane. Sand is then released from the hopper through an air-operated gate and the sand, flask, and pattern are lifted by compressed air and dropped several times, jolting the sand and packing it tightly around the pattern.

CASTINGS are separated from sand by shakeout method and put on a trolley conveyor.

Next a head is swung over the flask and sand, flask, and pattern are raised, squeezing into the head and compressing the sand more tightly around the pattern. The completed mold is then pushed off the pattern by air-operated pins at each of the four flask corners and rolled out into the pouring area. This operation is termed the jolt-squeeze-pin push-off method.

Larger molds are made by an operation similar to the pin push-off method. The jolting and compression of sand is accomplished in the same manner, but instead of a pin push-off arrangement a roll-over is used. Here, the flask and completed mold are rolled over in the crane after being lifted off the pattern, ready for the pouring operation.

After pouring

Molds and poured castings resulting from the first of the three methods explained are lifted off the small rail cars and placed in a ram device which rams the casting and sand out of the flask onto a metal oscillating conveyor. Leather conveyor belts cannot handle the hot castings and sand, so a metal conveyor is used which transports the materials by means of an oscillating or shaking motion in the desired direction.

Molds and poured castings from the other two operations already explained are lifted by a floor track swivel crane equipped with two clamps. One clamp is tightened around the top of the flask and the other around the bottom. Lifting together they carry the flask and casting to a vibrator that loosens the sand from the casting. Then the casting is dumped onto the metal oscillating conveyor and the flask is returned for refilling.

The oscillating conveyor carries castings and sand to a shakeout or separator machine. Here, the castings are shaken free of sand and dumped into a trolly conveyor. The sand is dumped on a conveyor belt which carries it back to the original storage area. At this point the belt passes over a magnetic pulley and dumps the sand into a hexagon screen. The magnetic pulley holds any metals or wires left in the sand after the shakeout to the belt and allows only the sand to fall into the screen apparatus. The metal and wire passes on around the pulley and when the belt leaves the magnetic field of the pulley, drops off into a dump chute.

Sand in the hexagon screen is separated from the core ends or chunks and conveyed to two sections of the main storage bin reserved for returned sand. It can then be mixed with new sand as needed.

Sorting and finishing

The trolley conveyor that receives the casting from the shake-out step travels through an outdoor cooling area and then back inside the foundry to a row of ten sorting tables. Each trolley car is dumped automatically at a predetermined sorting table.

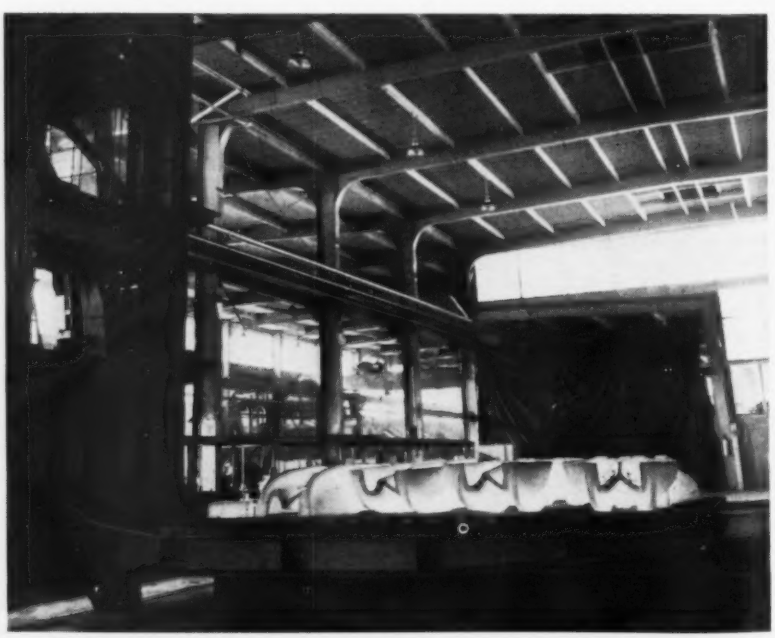
Upon sorting, castings are placed in tote boxes and carried by lift trucks through grinding, chipping, and sand blasting operations. Castings requiring heat treatment are placed on grids which are lifted and delivered to and from heat treating ovens and quench baths by an electric crane fork lift capable of handling loads up to eight tons.

Larger casting methods

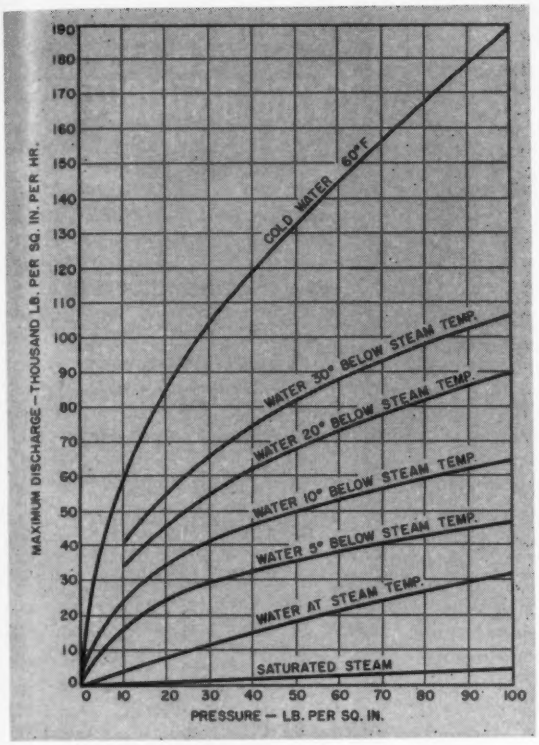
Two other methods are used to mold and cast larger pieces. One method involves a turntable twenty feet in diameter. Patterns are lifted onto the turntable by an overhead crane. The turntable has four stations for patterns. The patterns are revolved past a slinger using a centrifugal force method which forces the sand into a large flask and packs it around the pattern.

The flasks and molds are then rolled off the turntable onto a roller conveyor to a pouring operation.

The largest molds are prepared on the foundry floor and filled by motive slinger.



THIS 8-ton-capacity electric crane fork lift handles castings in the heat-treating room.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WATER 30° BELOW STEAM TEMP.
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WATER 10° BELOW STEAM TEMP.
WATER 5° BELOW STEAM TEMP.
WATER AT STEAM TEMP.
SATURATED STEAM

CONDENSATE capacity tables used as guides in steam trap selection should be qualified for temperature. Curves of this graph show the great variance in capacities at different temperatures of condensate flowing through a given orifice.

Steam traps—

How to install and maintain . . .

2nd installment of a two-part article

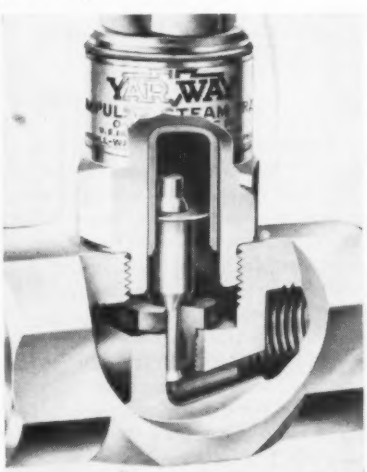
By C. N. MAXFIELD
Pacific Coast Manager
Yarnall-Waring Co.
San Francisco

STEAM traps are often blamed for troubles actually caused by erroneous judgment in selecting, sizing, installing, and maintaining them. The first installment of this article in the April issue discussed the selection of the proper steam trap to fit the application, and the following table summarizes the operating characteristics of the three groups of traps.

	Bucket or float trap	Impulse trap	Thermostatic trap
Ability to handle hot condensate	Good	Good	Poor
Air capacity	Poor	Good	Good
Sensitivity to condensate flow	Good	Good	Poor
Ability to withstand freezing temperatures	Poor	Good	Good

With the good operating characteristics of the impulse steam trap, it is unfortunate that space considerations in the first installment prevented showing an illustration of an impulse trap.

It is the most compact of all the traps, for even the 2 in. size will fit into a derby hat. Its simplicity is emphasized by the single moving part, and its durability by the bar stock steel construction with trim and body of stainless steel. The straight through connections make installation as simple as a gate valve.



STEAM IMPULSE TYPE TRAP

Safety load factor has already been shown to be an important consideration in selection of the proper size of trap. Choice of the proper factor varies with the style of trap chosen and the type of equipment to be heated. Another influencing factor is the proper use of condensate capacity tables as published in manufacturers' catalogs. Such tables should be qualified for temperature, otherwise they can be misleading.

Temperature variance

For example, a capacity table may show a certain trap as having a capacity of 5,000 lb. per hour. However, this may be its rating for cold condensate, and when operating with condensate at steam temperature, its capacity is reduced by 85% to 750 lb. per hour. Curves of this graph show the great variance in capacities at different temperatures of condensate flowing through a given orifice.

An adequately, yet economically, sized trap must be capable of handling the start-up load of cool condensate with quantities of air, as well as the operating load which is chiefly hot

Typical sizing table for jacketed kettles

Example of use of Yarnall-Waring trap selector bulletin

Table shows capacities of Yarway traps in gallons of substance cooked. Based on heating up to 212 deg. F. in 15 min. Assumed initial temperature: 60 deg. Factor of safety used: 2.

Pressure at trap	Trap size ½"	¾"	1"	1¼"	1½"	2"
10	45	80	130	180	230	320
25	65	120	170	230	300	430
50	90	160	220	290	390	550
75	100	180	250	330	450	630
100	110	200	280	370	500	690
150	125	220	330	440	560	770
200	135	240	370	500	620	830

condensate very close to steam temperature. Certainly the quickest way to compute trap size is by use of the steam trap selector.[1] Accompanying is a typical table for jacketed kettles from the Selector Bulletin.

An example: If jacketed kettle is to operate with 50 psi. steam and it holds 150 gal. of soup, table indicates a ¾ in. impulse trap can bring kettle to boil in 15 minutes.

Thus, the ordinarily somewhat complicated task of correctly sizing traps is greatly simplified for over 160 different applications when the impulse trap and selector are used.

Installing the trap

Instructions for intelligent installation of a steam trap should not need to include such elementary points as putting trap in line right side up and with flow in proper direction, but strangely enough these are fundamentals which are sometimes overlooked.

1. Use a good fine-screen strainer ahead of your trap to protect it from dirt, pipe scale, packing shreds, etc. After all, a steam trap is an automatic valve and should be protected as such. It is more than sheer coincidence that most trap manufacturers also manufacture strainers.

Choose a Y type strainer with woven basket of monel or stainless steel. The Dutch weave type of basket gives more straining area for a given size and greater strength. When practicable, use a nipple and small valve on strainer clean-out so that strainer basket may be blown down without interfering with service.

2. A trap is not a magnet. Your piping should be arranged to collect and deliver the condensate to the trap. Routing drainage from lowest point of apparatus to trap is best. If trap must be higher than the apparatus, special consideration and attention should be given to the fact (see check valves below).

3. Check valves. Good trapping practice calls for check valves after the traps, so discharge from one trap will not tend to block off flow from another. When trap discharges against a lift, always install a check valve downstream from the trap at bottom of lift. Check valves are not necessary when discharging to atmosphere.

4. Trap each coil, kettle, tank, or chest individually. Multiple units discharging to single trap usually result in short-circuiting and one or more units remaining cold. This is because pressure drops through different coils. Vessels are seldom the same and the greater the pressure drop the more steam will flow. Uneven heating and poor efficiency will result.

5. Install strainer and trap as close as convenient to outlet of equipment drained. This provides ease of maintenance as well as of installation. Only in the case of thermostatic type traps is it necessary to provide a "cooling leg" and to have trap some distance from outlet of coil to allow condensate sufficient time to cool so that it may operate the bellows. (The amount of cooling leg will vary with different styles of thermostatic traps.)

6. By-pass or no by-pass around trap? Except for extremely vital services, by-passes are getting to be a thing of the past. They are expensive and cumbersome to install and their first cost is far from their last cost, for a by-pass left open, or purposely opened by the machine operator, is an expensive luxury and will cause trouble all the way back to the boiler room.

Style important

Instead of using a by-pass, choose a style of trap which is easily accessible and can be quickly inspected or repaired internally. Some traps can have a complete renewal of all working parts within five minutes, and it is indeed an important process which cannot have the steam shut off for such a service. To this end, a shut-off valve should be installed in front of the trap and strainer, the check valve downstream taking care of possible back flow from the return line when it is necessary to isolate the trap for inspection or repair. Equipping the strainer cap with a valve will serve as a blow-

1. Trap selector bulletin T-1750 published by the Yarnall-Waring Co., 2300 26th St., San Francisco.

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It has been found that minute traces of water in aviation gasoline can stop the engine when flying in low temperatures, as at high altitudes, or over the pole. The amount of water involved is so small that it would not bother an automobile carburetor. To remove it for safe flying requires a special Filter/Separator. All metal parts going into this filter were specified to be 90-10 Cupro-Nickel. One of the contractors for the U. S. Navy is the Bendix-Skinner Division of the Bendix Aviation Corporation, Royal Oak, Mich. When Bendix-Skinner obtained the order, it called in Revere's Technical Advisory Service. A complete study was made of the blueprints and specifications, in order to set up the most economical purchasing schedules. When production began, personnel from the Welding Section of the Research and Development Laboratory maintained by Revere in Rome, N. Y., went to the Bendix-Skinner plant to share their know-how with the welders, so as to be sure the welds would pass strict inspection, yet be made at competitive costs.

Cupro-Nickel, 90-10, is highly resistant to corrosion and other forms of attack. Because it contains only 10% nickel, it is more economical than the richer alloys, yet in many applications just as satisfactory. We suggest you look into it.

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out for cleaning the strainer and as a test valve to observe if trap is draining equipment well.

Trap maintenance

Locating trap troubles is sometimes tedious work. An adequate program of preventive maintenance will keep your traps at high efficiency. Such a program should include periodic inspection of traps and cleaning of strainer baskets.

No recommended frequency can be set for inspection and testing of traps. The proper frequency must be based on your own experience. To assist in this endeavor you can utilize all or a combination of instruments, depending on the size of your plant. These include:

1. Thermometer in pipe between coil and trap. Quickly tells whether trap is maintaining a high equipment temperature and satisfactorily purging air and condensate.

2. Pressure gage on return tank in boiler room. Rise in pressure indicates trap blowing somewhere or by-pass open. Similar pressure gages on return lines from different sections of a large plant help to isolate such trouble more quickly.

3. Listening device. A steel rod or stethoscope held against trap is useful for testing individual traps. Operation of trap mechanism is telegraphed to your ear.[2]

4. Portable pyrometer. Probably the most useful of trap testing instruments. With it trap may be tested without shutting off pressure or disassembling. Feeling traps does little more than establish if trap is hot or cold. Pyrometer gives temperature to within 5 deg.[3]

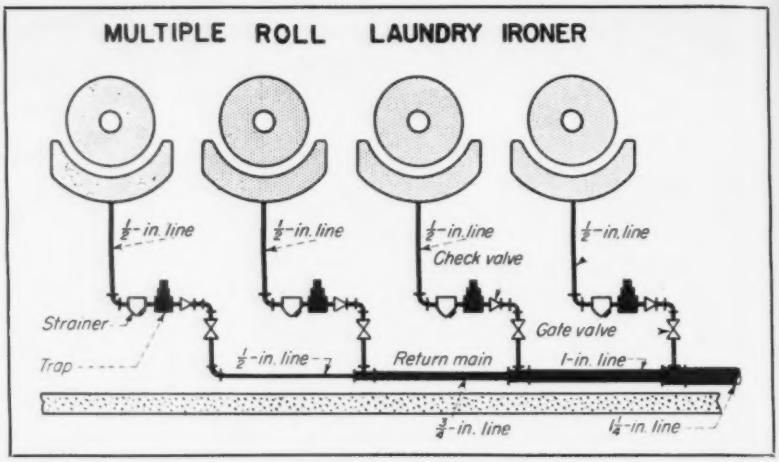
Once a faulty trap is located, trouble shooting begins to determine the reason for improper operation. If the reason is not readily apparent, observe discharge from trap by breaking union on outlet side, or better still use test outlet on downstream side.

Strainer screens should also be cleaned at the same time. Depending on the degree of dirt accumulation, screens may either be cleaned out under air pressure or soaked in a cleaning fluid, such as Rust-I-Cide.[4] A helpful time saver is to provide your maintenance man with a few extra screens to take around with him. He can then leave the dirty screens to be cleaned at the bench.

2. An inexpensive stethoscope is manufactured by Becton, Dickinson & Co., Rutherford, N. J.

3. A good pyrometer costs about $125. Most good trap salesmen carry one in their car. One source is Illinois Testing Laboratories, Chicago, Ill.

4. Available from Rusticide Products Co., Cleveland 14, Ohio.



CORRECT installation of steam traps is shown in this diagram of a multiple roll laundry ironer. Required quick heating is provided, and each of the rolls operates at top efficiency.

The following checklist will help you diagnose any difficulty.

Cold trap discharging:

1. Trap too small. Open strainer blow-out and assist trap with additional capacity. Install larger trap.

2. Strainer plugged, or partially so; full pressure not reaching trap. Clean out line or strainer.

3. If thermostatic type, bellows overstressed and cannot fully open seat orifice. Replace bellows.

Cold trap not discharging:

1. Pressure not reaching trap.

a. Strainer plugged with dirt. Blow out or replace basket.

b. Inlet valve to equipment closed or has broken stem.

c. Outlet valve from trap in return line closed or broken.

d. Plug in line to trap at elbow or nipple.

2. Pressure too high.

a. Pressure reducing valve in steam supply out of order.*

b. Orifice enlarged by wear.*

c. Wrong orifice installed — too large for bucket to operate.*

3. Sufficient pressure, but no flow.

a. Trap is air locked; vent hole in bucket plugged.*

b. Trap dirty, control orifice plugged.

c. Worn or defective mechanism.

Hot trap leak suspected:

1. No condensate coming to trap due to broken siphon in siphon drained cylinder, or pinhole leak in siphon tube.

2. Open or leaky by-pass valve around trap.

3. Trap may not be closing tightly.

a. Dirt or scale may be holding valve from seat.

b. Worn parts; wire drawn valve or seat.

4. Ruptured bellows.

5. Loss of prime; no water in body to float bucket to closed position.* Close inlet valve to apparatus a few minutes to allow water to collect.

6. Is back pressure in return line abnormally high?

Slow heating:

1. Trap too small to rapidly discharge heavy starting load. Install larger trap, or another trap in parallel.

2. Too much air for trap to handle. Pick a trap with greater air handling capacity.

3. Short circuiting. Are units individually trapped?

4. Low steam pressure at start of process due to heavy demands elsewhere in plant (especially on Monday mornings).

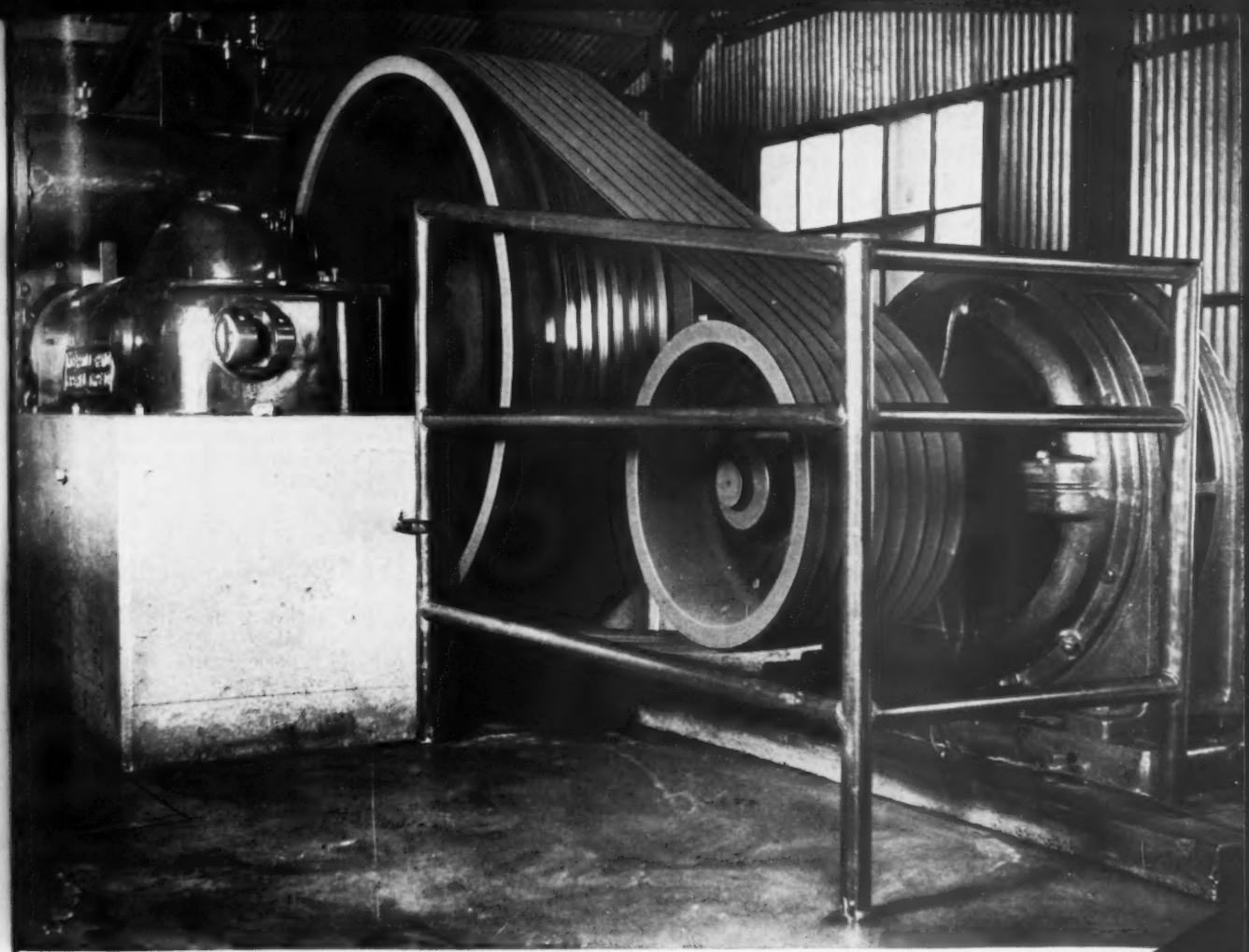
Imaginary troubles:

1. Is trap installed in right direction with arrow pointing toward return line?

2. Discharge too hot. Do not confuse flash steam with live steam. Flash steam is always formed when a trap discharges very hot condensate to a lower pressure. In fact, if there is no flash steam, trap is probably not operating as it should be. You *cannot* have hot equipment *and* cold condensate which forms no flash.

Flash steam always looks worse than it is, for a cubic inch of water flashing will become nearly a cubic foot of steam. In the ordinary return line this usually quickly recondenses to water for there is not much heat in it.

* These difficulties apply only to bucket-type traps.



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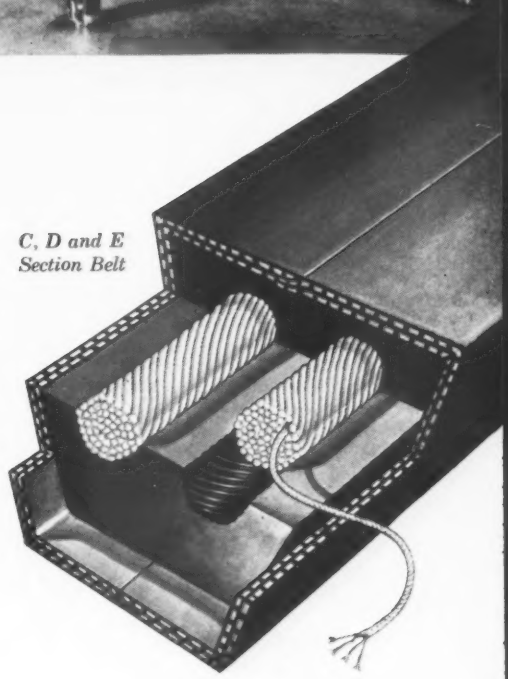

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SAFETY HINTS for supervisors

TRAINING, education, and roving inspection of safety features are three very important phases of any safety program. Plant supervisors are usually responsible for accomplishment of these tasks. G. H. Supple, vice president, General Petroleum Corp., offers these ideas for supervisors' improved safety performance:

1. Maintain a consistent level of safety thinking and action. Safety is too often put in the background until an accident occurs. Then the safety rules are brought out, dusted off, and used until memory of the accident is weakened. Such a here-today, gone-tomorrow attitude toward safety is an open invitation to disaster. Safety and job planning are inseparable. Supervisors are the real safety men.

2. Take immediate and thorough action to correct causes of "near misses." The case where a man is *almost* involved in an accident, but is fortunate enough to get by uninjured, is the ideal opportunity for supervisory correction. Analyze the cause of the "near miss" and make the necessary change in equipment or procedure.

3. Never be satisfied with "it was just one of those things" as an answer to the cause of an accident. Accidents do not just happen; they have a cause. It may be ignorance, laziness, selfishness, risk taking, poor evaluation, timidity, faulty equipment, or any number of causes, but every accident has a cause. The supervisor must find that cause and take the necessary action to eliminate it.

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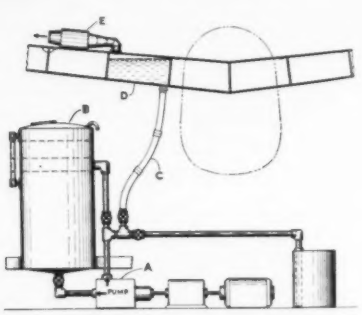

HOW IT WORKS—A reversible pump (A) pumps sealant from a supply tank (B) through a conduit (C) attached to the drain port of tank (D), filling tank with sealant. Pump (A) is then reversed and the sealant is pumped back into supply tank (B), leaving a coating on the walls of tank. A suction device (E) attached to the filler port of tank causes the coating of sealant to harden quickly.

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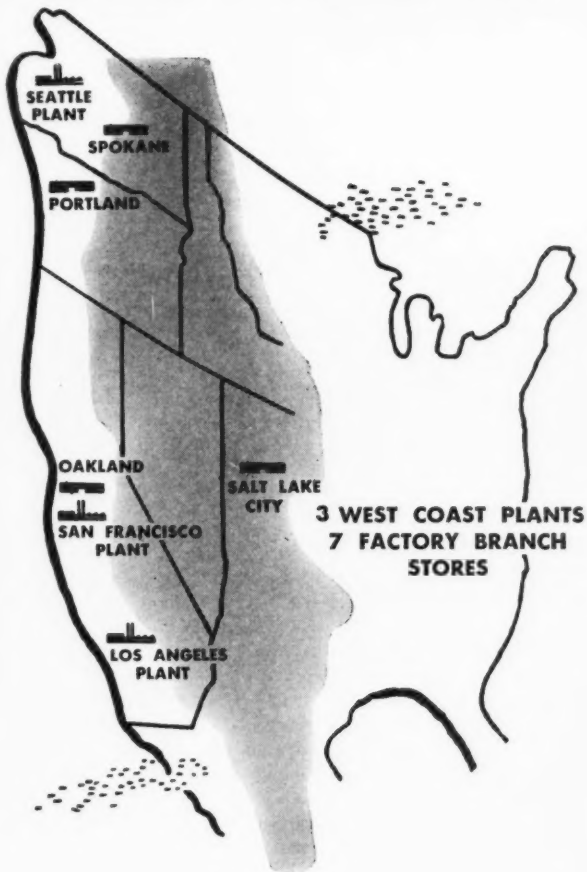

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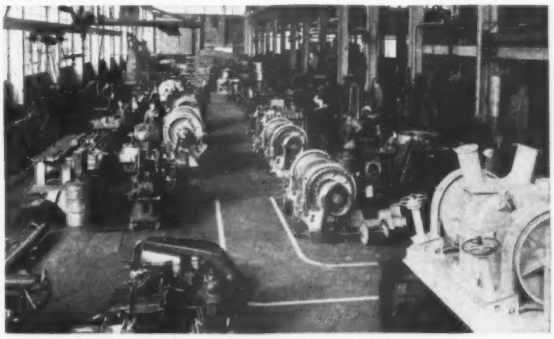
experienced engineering

Link-Belt is a world-recognized engineering firm. Our West Coast plants and offices have large engineering staffs with intimate knowledge of local conditions. Each plant is prepared to carry through complete installations from planning, manufacture and erection.



modern fabricating facilities

Link-Belt operates three modern plants in the West—at San Francisco, Los Angeles and Seattle. Not only do these facilities help speed deliveries—they also save money on freight costs compared to Eastern shipments.

convenient warehousing

In the seven major Western industrial areas, Link-Belt maintains over-the-counter service on a complete range of power transmission, conveying and elevating products. There are factory branch stores to serve you at Spokane, Seattle, San Francisco, Salt Lake City, Portland, Oakland and Los Angeles. In addition, 32 authorized stock carrying distributors in the West stock Link-Belt products.

LINK-BELT

LINK-BELT COMPANY: Plants, Sales Offices and Factory Branch Stores at San Francisco 24, Los Angeles 33, Seattle 4. Sales Offices and Factory Branch Stores at Portland 10, Spokane 10, Oakland 7, Salt Lake City 1. Stock Carrying Distributors in Principal Areas 13,709

One source . . . one responsibility

for materials handling · power transmission · processing machinery

GETTING the product or service sold is after all the biggest problem. It affects everyone in the company.

CONSEQUENTLY, as a special service to our readers in helping them move their products into consumption, WESTERN INDUSTRY begins in this issue a series of guest contributions from men qualified to discuss intelligently various aspects of marketing.

Walter M. Boland, of Boland Associates, San Francisco, who has provided this month's contribution, heads an advertising agency whose clients include Schlage Lock Co., Western Machinery Co., Ampex Electric Co., and William Wallace Co.

What a successful company does . . .

The two weakest spots

(As found by a well-known California manufacturer in the $8,000,000 sales bracket, in a study of its own operations.)

I—MARKETING

The manufacturer defined marketing as all planned and organized effort having to do with the movement of the product from the production line to a satisfied user—i.e., market research, product and package styling, sales, distribution, promotion, advertising, publicity, public relations, and product field service.

The study clearly revealed not only inadequate plans and execution under the various components of marketing, but also insufficient understanding of the general subject by management, sales department, employees, stockholders, distributors, and dealers.

Among detailed recommendations resulting from the study were:

1. Sales or marketing should be given equal status at the management level with engineering, production, finance, etc.

2. Strong improvement was needed in the quality of business communication (sales brochures, mailing, material, dealer aids, business publication advertising, planned publicity).

3. Sales training of their own personnel was inadequate and their incentive earning plan was not competitive.

4. Their distribution pattern (location and number of distributor/dealers) was based upon the formula of the 1940's and did not reflect economic and population shifts of the past 10 years.

5. The company was not well enough known to general business and financial management east of the Rockies (80% of their potential).

II—PRODUCTS

To a varying degree they either reflected lack of market research prior to design (did not fill a market need as well as was possible) or needed re-styling for competitive reasons. Further, product costing in all cases did not include a sufficient factor for adequate marketing (sales expense).

In addition, their product base needed broadening, both to better utilize their production and sales facilities and to enhance their competitive position.

WHAT does marketing mean to you? Taking first things first, how does a successful company go about the marketing of its product or service?

Before spending thousands on engineering and tooling, it spends hundreds on market research and gets factual answers, not personal opinions, to the following basic questions.

Is there a need, new or old, which we can fill adequately?

Who can buy this product? (What is our market?)

What will the product do for him? (What are its features and user benefits?)

Is it worth what we must ask? (Are we competitive?)

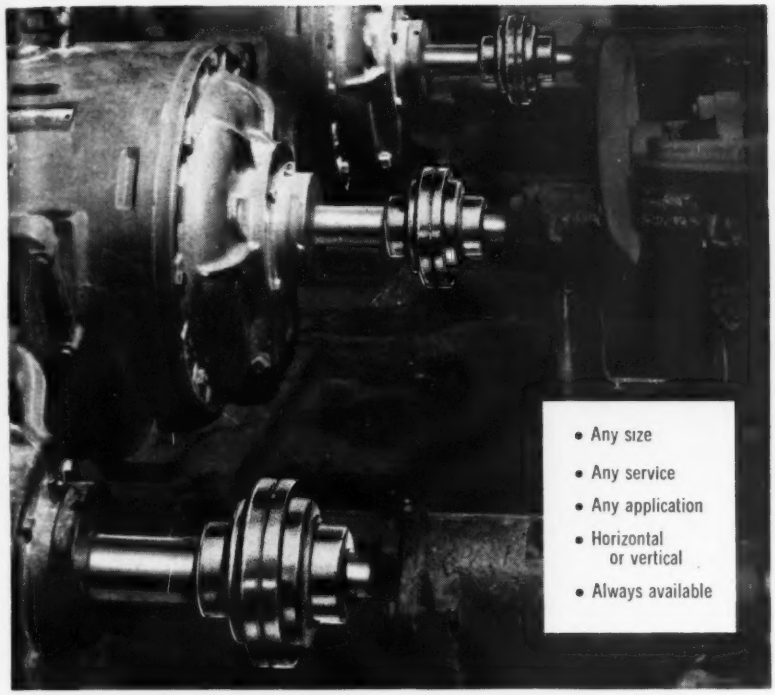
Where is our prospect located? (Most markets are regional, not national.)

How do we economically reach him? (Our own sales engineers, distributors, or manufacturers' representatives, supported by direct mail, trade advertising, or what?)

How and when does he buy? (All businesses are seasonal—even bread.)

This fact-gathering is best performed by professional research organizations, supervised and their findings analyzed and summarized by your markting or advertising agency.

Why the latter? Because their viewpoint is objective (yours cannot be—fully) and because they are (or should



FALK Steelflex Couplings save you money by prolonging the work-life of connected machinery

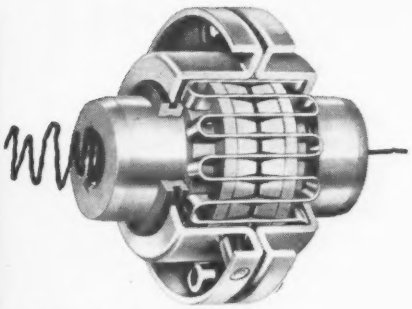
Ever since the first Falk Steelflex Coupling was designed and built, more than thirty years ago, we have firmly held to these beliefs:

1. A coupling, to give fullest value, must do more than merely connect driving and driven machinery—it must protect the machinery and prolong its life.
2. A coupling, to be truly flexible, must overcome the effects of shock and vibration, as well as shaft misalignment (see column at right).

Proof of the soundness of these beliefs is furnished by the record. Many Falk Steelflex Couplings installed 10, 20, even 30 years ago are still giving trouble-free service—still providing maximum protection for the machinery they connect!

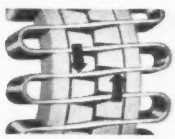
IMMEDIATE DELIVERY
from West Coast stocks

Couplings and spare parts in Factory Stock at Oakland, California and Portland, Oregon. Authorized stocking Falk Distributors throughout the West.



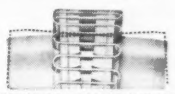
How Torsional Resilience smothers shock and vibration

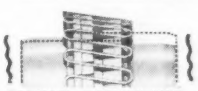
The steel gridmember connecting hubs fits snugly only at outer edges of tapered hub-teeth. As load increases, gridmember flexes against teeth in proportion to load, providing cushion that spreads peak loads over longer time increment and reduces stresses in machinery.


UNDER NORMAL LOAD

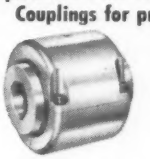
...Accommodates shaft misalignment... Permits free end float

The exclusive FALK all-steel grid-groove design provides compensation for parallel and angular shaft misalignment . . . permits free end float.


ANGULAR MISALIGNMENT


PARALLEL MISALIGNMENT
FREE END FLOAT

Special or Dual Purpose FALK Steelflex Couplings for problem applications

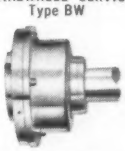

LIMITED SPACE
Type FS

RAPID REVERSING SERVICE—Type CM

HIGH SPEEDS
Types H and HH

BRAKEWHEEL SERVICE
Type BW

OVERLOAD CONTROL
Type FT


EXTENDED SHAFT
Type P

FLOATING SHAFT
Type PP

Do you have a coupling problem?

If so, describe it in writing—we will gladly recommend the proper Steelflex coupling for your needs. Write to Department 247.

THE FALK CORPORATION, Milwaukee 8, Wisconsin

MANUFACTURERS OF

- Motoreducers
- Speed Reducers
- Flexible Couplings
- Shaft Mounted Drives
- High Speed Drives
- Special Gear Drives
- Single Helical Gears
- Herringbone Gears
- Marine Drives
- Steel Castings
- Weldments
- Contract Machining

FALK

...a good name in industry

be) experienced in this field over a wide range of products.

Next, with the facts at hand, and assuming the atmosphere appears favorable, you decide what and how many to build the first year, for how much (allow 25-30% for sales and promotion) and who is going to sell it (your own field organization, distributors or manufacturers' representatives—this is a matter of operating expense).

Get budget guidance

Next, call in your agency, give them all the facts (they are, or should be, a part of your sales department) and accept *their* advice on the promotional effort *they* think is necessary to accomplish *your* sales objectives. If it's more than you can afford the first year, reach mutual agreement on what portions of the program can be reduced or deferred, and agree on a priority of project.

This will give both of you budgetary control and guide all effort within the framework of an organized plan.

When the promotion or marketing program and its supporting budget are approved, select a committee of two (advertising and sales or marketing manager; or if you have no advertising manager, then the president or vice president-sales and sales manager) to work with your agency.

Take pains to keep the rest of your organization out of the act! Everyone is an "advertising expert," everyone wants to write copy, criticize ad layouts, get in the act. Nothing will so confuse or hamper the best of planned programs.

Advertising by a competent agency is a highly trained, professional business. Yours may be a particularly complex product, technically, you think, way over your agency's head. You build it, give them the information they request, and let them guide your selling efforts. (Or do you regularly argue with your doctor, lawyer, or tax consultant regarding their professional experience and ability?)

Marketing fills a need

Next, with the guidance and help of your agency, consistently merchandise your promotion efforts to your sales representatives, your prospects and customers, your stockholders, employees, particularly your executives, and through trade conventions, your industry.

Why? Because our economy, our standard of living, our individual and corporate success is dependent upon the profitable sale of the efforts of our engineers and production geniuses. By themselves they create the answer to a need or create a new need—marketing alone takes the result of their effort and fills the need.

Your own organization and associated groups need to be constantly reminded of the importance of marketing and your contribution in that direction.

How to do this? In various ways. Start by sending reprints of your ads three or four times a year to your prospects, customers, etc. Publish a facilities brochure so people can know graphically who you are and what you possess.

Publish an annual report (unless you're a closed corporation) and make it an interesting, informative pictorial report of accomplishment, not a dry statistical report of interest only to your banker and tax experts.

Style your stationery, labels, business forms, and literature for eye-appeal and family continuity of resemblance. Mount samples of all such material and ads on display panels where your employees can see them daily and better understand your efforts to protect their jobs.

Exhibit these panels at sales meetings and conventions—keep people informed. Even in your own organization it's hard to judge your promotion program as a single ad or piece of literature passes over your desk. You must assemble the pieces to see the whole picture.

BUSINESS CENSUS planned for this year

THIS YEAR'S Census Bureau activities will include a survey of business, manufacturers, and mineral industries. Facts will be compiled to assist businessmen in developing markets, determining production schedules, arranging distribution through efficient channels, and making the many management decisions that are required to meet the ever changing industrial and consumer demands.

Many businessmen rely upon the industrial and trade census reports for reference data in preparing production and sales programs. Sales of census reports indicate the wide demand for current information in industry. Over 500,000 of the 1948 Census of Business reports for counties, showing statistics for different kinds of industries in each county, were sold. Most of these sales were to businessmen for use in the conduct of their own businesses.

In the West

Low Temperature EUTECTIC WELDING ALLOYS

SPECIAL EUTECTIC WELDING SERVICE DEPARTMENTS

are maintained by these leading distributors

BERKELEY 2, CALIF.
American Supply Co.
Tel: THornwall 3-0275

BILLINGS, MONT.
Reymer Machine Co.
Tel: 4-4456

BOISE, IDAHO
Idaho Motor Supply Co., Inc.
Tel: 2-4508

DENVER 1, COLO.
M. L. Foss, Inc.
Tel: Ke 5151

LOS ANGELES 25, CALIF.
Gordon Duff, Inc.
Tel: BRadshaw 2-3181

PHOENIX, ARIZ.
H. J. Maffeo & Son
Tel: Alpine 30900

POCATELLO, IDAHO
Billmeyers Wholesale Dist.
Tel: 698

PORTLAND, ORE.
The Portland Machinery Co.
Tel: Atwater 6555

SALT LAKE CITY 4, UTAH
The Galigher Co.
Tel: 9-8731

SAN DIEGO 1, CALIF.
G. S. Parsons Co.
Tel: J-3136

SAN FRANCISCO 3, CALIF.
C. W. Marwedel
Tel: Underhill 1-2125

SEATTLE 4, WASH.
Cragin & Co.
Tel: Elliott 0052

SPOKANE 2, WASH.
Gibson Welding Supplies, Inc.
Tel: Riverside 8071

The "GOLD" Rods

Between now and November 1st, 1955 five weldors will find a special "gold" Eutec-Rod in their shipments. One represents the billionth "rod" produced by Eutectic Welding Alloys Corporation. The weldor who returns it will receive a $100 award. Four other lucky weldors will receive $50 awards when they return the other "gold" rods marking 50 years of research. This is Eutectic's way of saying "Thanks" to weldors everywhere for their increasing use of "Low Temperature Welding Alloys."

Originators not Imitators

"Every kind of imitation speaks the person that imitates as inferior to him whom he imitates, as the copy is to the original."

LORD SOUTH

R. D. WASSERMAN

In every age, in welding and every other industry, you will always find those whose only claim to fame for their product is that it is "just as good."

More than 50 years ago, J. P. H. Wasserman, a Swiss metallurgist, pioneered a new welding process. He blazed a trail that others have tried to follow. Relentless research following his discovery has perfected Eutectic's "Low Heat Input" metal joining process which provides the high strengths of fusion welding using the lower heats associated with brazing.

Eutectic's research has never been equalled. Very simply, that is why no welding material imitating Eutectic "Low Temperature Welding Alloys"® can be "just as good" or produce equal results and savings.

Year after year, "Eutectic" has originated new and ever better welding alloys to make the weldor's job easier and more profitable. The rapidly increasing preference for Eutectic "Low Temperature Welding Alloys" in over 87,000 American industries is proof of Eutectic's leadership. It is testimony that the American weldor is too smart to be fooled by imitations. The American weldor realizes the importance of getting all the advantages of Eutectic's "Low Heat Input" metal joining process—the elimination or minimization of overheating, warping, distortion, embrittlement and other dangers to base metals.

To the weldor, Eutectic's process means "Better, Faster, Cheaper" welding. To industry everywhere, "Eutectic" has made welding more profitable, with an ever-widening field of application for production, maintenance, and salvage of metals and metal products.

A FEW "EUTECTIC" FIRSTS
1940-1955

- U.S. Patent #2,583,163. Surface alloying process for bonding metals.
- U.S. Patent #2,288,869. First Torch Alloy for joining cast iron with color match, without fusion.
- U. S. Patents #2,359,813, #2,410,850, #2,544,000. First metallic film coating to enhance Surface Alloying.
- U. S. Patents #2,279,282, #2,279,283, #2,279,284. First nickel bearing copper alloy for high tensile joining.
- U.S. Patent #2,481,053. First torch alloy and flux for joining high aluminum content metals.
- U.S. Patent #2,471,803. First "Low Amp" coating for metal arc welding of cast iron.
- U.S. Patent #2,632,000. First low-melting electrode for high tensile strength joining of aluminum.
- U.S. Patent #2,632,835. First "Low Amp" electrode coating for high alloy steels.
- U.S. Patent #2,626,339. First electrode for high tensile strength joining of copper.

RESEARCH—BACKBONE OF PROGRESS

During the past 50 years Eutectic Welding Alloys Corporation has learned much. It is possible for imitators to analyze our welding rods, electrodes and fluxes. But originating and producing them is an achievement only "Eutectic" can claim. Only the long, hard road of doing it can provide the answers.

The time spent in imitation is lost, for long before a "copy" can be made, Eutectic's research has perfected other new and improved materials.

Today, in Eutectic's own research centers throughout the world, teams of metal experts create and test newer and better products for metal joining. And, in its own up-to-the-minute plants, meeting rigid standards of quality, "Eutectic" turns these research products into "Low Temp" EutecRods and "Low Amp" EutecTrodes that bring the benefits of "Low Heat Input" metal joining into shops everywhere.

ORIGINATORS NOT IMITATORS

The research behind this phrase is your assurance of the most modern welding materials known. It is your assurance that you are applying advanced "Low Heat Input" metal joining techniques to your critical work and that you have the most modern developments at your fingertips.

Don't be fooled by those who tell you that any ordinary rod or electrode is "just as good." Nothing can match Eutectic "Low Temperature Welding Alloys" performance.

Remember, it is the quality of the finished job and the ease and speed with which you do it that determines real economy, and not a few pennies difference in original cost. Because of its research facilities, only Eutectic Welding Alloys Corporation gives you true "Low Heat Input" metal joining and helps you eliminate the risks of dangerous overheat overheating and the subsequent distortion and damage to base metals. And that, after all, is what you are always after.

READY TO PROVE WHAT WE SAY

To bring you all the benefits of Eutectic's research, our District Engineers are ready to go right into your shop to show you how Eutectic "Low Temperature Welding Alloys" will solve your welding problems. Your Eutectic District Engineer will show you how the same electrode holder or torch you use with conventional materials gives you "Better, Faster, Cheaper" welds with "Low Temp" EutecRods and "Low Amp" EutecTrodes . . . with substantial savings in work, time, gas and welding materials.

YARDSTICK OF PERFORMANCE

To help you select from among the more than 160 EutecRods and EutecTrodes those that will give you largest savings per job, write for your free copy of our new 32-page DirectoRod Guide. Whatever your welding problem—production, maintenance or salvage, there's a EutecRod or EutecTrode to do the job faster, better, and cheaper. Use the convenient coupon below.

SYMBOLS OF DEDICATION

These seals denote our proud contribution to American industry: 15 Years of "Golden" Savings, 50 Years of Research. These years have seen many great achievements. And, for the future, we look forward to ceaseless weldgineering and the continued application of Eutectic's research to your service.

R. Wasserman

President, Founder, Director of Research

®Registered trade mark of Eutectic Welding Alloys Corp.

EUTECTIC

Eutectic Welding Alloys Corp.
40-40 172 Street, Flushing 58, N. Y.

Please send your new DirectoRod Guide.

Name.....

Company.....

Company Address.....

City.....State.....

"MECHANIZE"
YOUR MATERIAL HANDLING
with these modern time and cost-savers

Faster Piling with the HANDIPILER

• Saves time, money, and manpower. Ideal for storage areas—loading, unloading, piling, stacking. Boom is designed to pile up to 12 ft.—extends into corners, box cars, trucks, trailers.

Handles bags, bundles, packages up to 135 lbs.—reversible apron—conveys up or down. Available in 14 and 24 inch belt width. Write for Bulletin 63 E. Address WI-55.

Straight or Curved All-purpose ROLLER CONVEYOR

• Available in a complete line of sizes and capacities designed to allow the selection of the best roller conveyor for the job—from a 1 inch diameter roller, capacity 35 lbs. Any commodity with one smooth riding surface can be carried—boxes, cases, cartons, lumber, milk cans, brick, tile, units and parts. Straight sections and 90° and 45° curves. Write for Bulletin 63 E, address WI-55.

STANDARD CONVEYOR COMPANY
General Offices: North St. Paul 9, Minn.
Sales and Service in Principal Cities

SEATTLE 4: Russell G. Daley, 502 First Ave. S.
PORTLAND: 1115 N.W. Glisan St.
SAN FRANCISCO: 840 Harrison St.
LOS ANGELES: 115 E. 23rd St.

Send for Bulletin 63-E, describing Standard gravity and power conveyors and conveyor units—address Dept. WI-55.

Standard GRAVITY & POWER CONVEYORS

Western atomic energy developments

Plenty going on with groups and companies, San Francisco conference reveals

STANFORD Research Institute's atomic energy conference in San Francisco April 4 and 5 (sponsored jointly with the Atomic Industrial Forum, Inc.), drew an unexpectedly large crowd of people from all over the country, evidence that the interest in this topic is tremendous. The leading article in this issue of WESTERN INDUSTRY gives perhaps the first complete picture of North American's sodium reactor under construction in Southern California. Other Western developments reported on include the following:

Coolants studied

Rocky Mountain Nuclear Power Study Group. Composed of Arizona Public Service Co., Phoenix; Idaho Power Co., Boise; Public Service Co. of Colorado, Denver; Utah Power and Light Co., Salt Lake City; Ebasco Services Inc., New York; Fluor Corp. Ltd., Los Angeles; Minnesota Mining and Manufacturing Co., St. Paul; Riley Stoker Corp., Worcester, Mass.; Phillips Petroleum Co., Bartlesville, Okla.

Each company supplies a member of the management committee, a full-time resident representative at Idaho Falls, with a project manager directing the committee. Ray L. Stoker, the project manager, reported:

"The effort to date has been given mainly to a generalized heterogeneous type reactor cooled and moderated with water. Heavy water as well as light water and various degrees of boiling permitted within the reactor will also be considered. Even the possibility of employing an organic coolant may be entertained eventually if attractive performance can be demonstrated.

"This generalized reactor concept, characterized by a single fluid which serves as both coolant and moderator, may at first glance appear over-ambitious at the preliminary study level, but there is actually a considerable amount of established reactor technology that is common to all of the mentioned variations. The associated power plants bear an even greater similarity . . .

Performance stressed

"We are not promoting a novel or unique reactor concept and we welcome any good idea, scheme, or technology which appears to offer something we can integrate into an economically attractive nuclear system. We believe the field will develop shortly, if it has not already, to the point where this approach will be a practical one and one that is to the liking of prospective suppliers of reactor components and services.

"We are more prone to stress performance requirements of the vari-our components for our contemplated system, rather than the fabrication specifications.

"As an example of the problems currently under study, there is the ever-present one of non-uniform distribution of neutron flux and, consequently, non-uniform heat generation within the reactor core. If this non-uniform generation of heat within the different coolant passages is uncorrected, or not compensated for, an undesireable reduction in the mixed mean reactor coolant exit temperature, and hence a lower temperature and pressure of the turbine throttle steam will result.

"Compensation for this difficulty by means of throttling the coolant flow through these core passages of lower heat generation and by various divisions of the flow, both within and outside the reactor, have been considered by many and reconsidered by ourselves. In addition to reviewing the usual applications of a reflector, distributed poisons, and non-uniform fuel loading within the core as means to flatten the neutron flux, some speculation has been given by the group

Steel Problems?

Call Jorgensen First

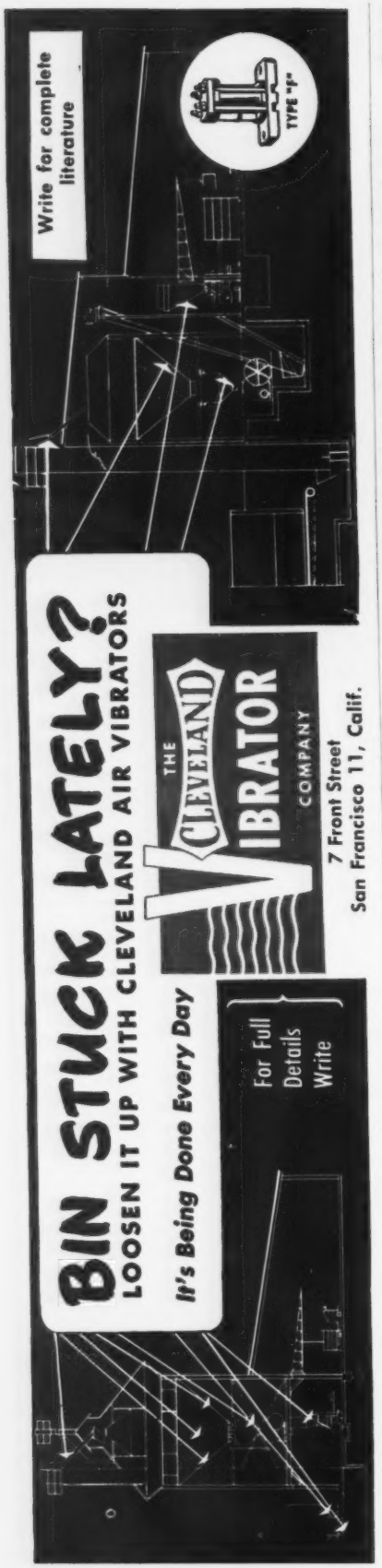
Production stalled on a fast job? You need not be drawn out of shape when you run into a steel problem. Best bet is to call Jorgensen first—fast! Size doesn't count when you order from Jorgensen's complete warehouse stocks of carbon, alloy, stainless, tool and specialty steels. Or maybe you need aluminum from the full supply of sheet, plate, rod, bar and extrusions. In either case, you're treated like a big wheel when you *CALL JORGENSEN FIRST!*

EARLE M. JORGENSEN CO.

STEEL

LOS ANGELES	OAKLAND	SAN FRANCISCO	HOUSTON	DALLAS	TULSA
10650 S. Alameda	1657 W. Grand Ave.	700 Pennsylvania Ave.	5311 Clinton Dr.	2200 W. Commerce St.	7311 East Pine St.
LOrain 7-1122	Hlgate 4-2030	Mission 7-7800	ORchard 1621	Riverside 1761	85-1511

FORT WORTH: Dial FOrtune 0578


Write for complete literature
TYPE "F"
BIN STUCK LATELY?
LOOSEN IT UP WITH CLEVELAND AIR VIBRATORS
It's Being Done Every Day
THE CLEVELAND VIBRATOR COMPANY
7 Front Street
San Francisco 11, Calif.
For Full Details Write

to utilizing various degrees of boiling within the reactor to accomplish this end."

Problems encountered

Nuclear Power Group, composed of Pacific Gas Electric Co. and Bechtel Corp., both of San Francisco; American Gas & Electric Co., New York; Commonwealth Edison Co., Chicago; Union Electric Co., Missouri. C. C. Whelchel, chief mechanical engineer of P.G.&E., reported that selection of a reactor design is progressing and a proposal to build a nuclear power plant will be submitted to the AEC.

Problems involved include isolation, which means first plants may not be located as near load centers as most conventional plants, and therefore initial construction costs and transmission expense may be greater. Elaborate protective structures and control devices may be required in lieu of isolation—or both may be required.

Operation and maintenance problems in handling radioactive materials will require different operating procedures. Plant outages for equipment repairs or inspection may require far more time for conventional plant equipment, which in turn may require more reserve generating capacity for the system than would be required with conventional plants.

Last but not least, the Atomic Energy Act of 1954 provides for private development and ownership of nuclear plants and equipment, but complete control over supply, disposal, and cost of fuel is retained by the government.

J. N. Landis, vice-president, Bechtel Corp., said availability of water is a prime essential to any power plant, including a nuclear plant, because no means has been developed of converting nuclear heat into electric energy without the use of a steam turbine and its associated requirement of condenser circulating water or cooling tower make-up water.

Regarding design, the dilemma is whether to invest in a low output experimental plant of high unit capital and operating cost, or in a large output, lower cost plant containing an as yet relatively untested reactor and associated equipment. All present designs of motors, sensing apparatus, and control apparatus must be checked and possibly redesigned to withstand the tremendous intensity of nuclear radiation in which they will be bathed in nuclear plant service.

Pumping units developed

Byron Jackson Co., Los Angeles. Carl Blom, vice-president and chief engineer, reported that his company has been developing and building pumping units for radioactive water, liquid sodium, heavy water, bismuth, and radioactive slurry. Pressures vary from up to 5,000 psi., and in temperature up to 1200 deg. F.

Hydraulic requirements for reactor circulating pumps are not too severe, as pumps already have been developed for industry to meet similar requirements.

What makes the design of reactor pumps difficult and costly to manufacture is the demand of "zero leakage," the limited selection of materials for manufacturing the pumps and the difficulties in obtaining all the necessary information to develop a good design. The "zero leakage" means that the driver, which is usually an electric motor, and the pump have to be designed together to form a hermetically sealed pumping unit.

The pump unit types may be divided into two classes; the "zero leakage" and the "controlled leakage" type. The "zero leakage" units or hermetically sealed type are built in the following variations:

1. Canned motor pump unit.
2. Submersed motor pump unit.
3. Gas filled motor pump unit.
4. Oil filled motor pump unit.

Of the canned motor unit, three basic types have been built:

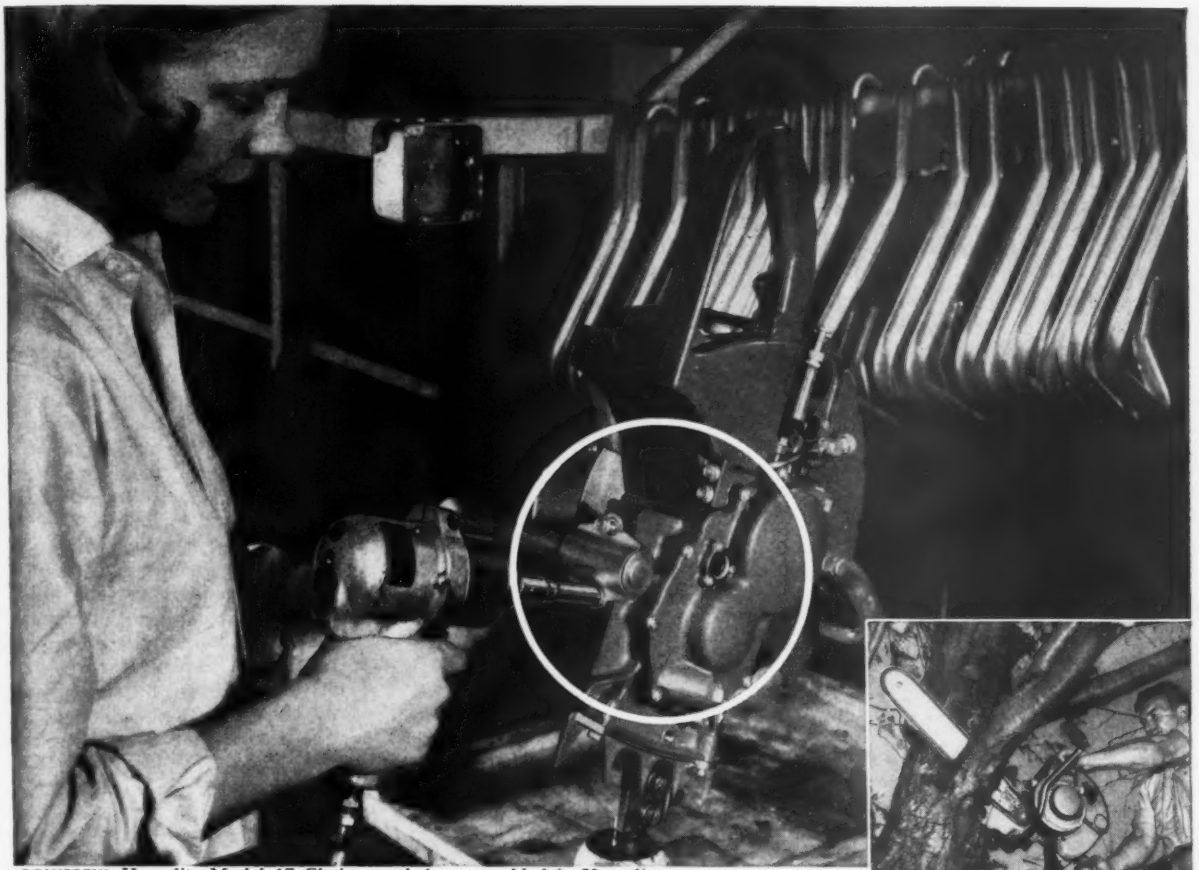
1. High pressure, stator liner takes full pressure supported by lamination.
2. High pressure, stator liner with balanced pressure.
3. Low pressure, stator liner takes full pressure—no support.

The "controlled leakage" pump

Carl Blom

J. N. Landis

C. C. Whelchel



POWERFUL Homelite Model 17 Chain saw being assembled in Homelite factory at Port Chester, N.Y.

ONLY 22 LBS., Model 17 Homelite Chain saw delivers 3.5 hp — power to spare for felling trees 4 feet in diameter. Cuts up, down, left or right; is easily carried up trees.

Girl assembles chain saw 30% faster with RB&W SPIN-LOCK screws

SPIN-LOCKS hold tight where previous fasteners let go

Usually production men turn to RB&W SPIN-LOCK screws because they need a fastener that won't lose its grip.

But Homelite Corporation of Port Chester, N.Y. got a lot more value than they expected when they tried SPIN-LOCKS on their famous chain saws. Regular screws plus washers had loosened rapidly under vibration when the saws went to work.

SPIN-LOCK cured this problem, of course. Homelite reports: *"We've had no loosening of screws when the saws get out in the woods."* And, Homelite goes on, *"We also found through time studies that we saved an average of 30% in time required to insert and drive the screws — giving us lower labor cost and faster assembly time."* What's more, *"The average cost of* SPIN-LOCKS *and regular screws plus washers is just about the same."* Measure of Homelite's satisfaction: the new Model 17 saw uses *79* SPIN-LOCKS in *16* types and sizes.

Whether you want a fastening device with a bull-dog grip or a way to lower assembly time and costs, an RB&W SPIN-LOCK screw could be the answer. It's easy to find out — just write the nearest RB&W office. RUSSELL, BURDSALL & WARD Bolt and Nut Co., Port Chester, N.Y. 4.11

Check Sweet's Design File for RB&W SPIN-LOCK Catalog

RB&W Spin-lock

U. S. Pat. No. 2,253,241

The Tighter, Stronger, Surer Fastener!

110 YEARS MAKING STRONG THE THINGS THAT MAKE AMERICA STRONG

type refers to shaft seal pumps which use a standard type of driver such as motor, steam turbine, etc.

Volume expected

Kaiser Engineers, Division of Henry J. Kaiser Company. Dr. W. C. Rueckel, vice-president, said the company had established a nuclear power study group within its Atomic Energy Division.

He thought the small power plant business of the future could be of significant volume. One of only 5,000-kw. capacity, located far from surface transportation, would require 350 cargo-plane loads of fuel a year, but could operate three years on 1,500 lb. of enriched uranium. Production of heavy water could very well become a major industry.

Testing apparatus

Shell Development Co., Emeryville, Calif. Vincent P. Guinn, chemical physics department, reported that steel gears have been irradiated at Oak Ridge and then operated at Shell Development Co. with non-radioactive gears at various loads and with various lubricants. The presence of metal worn off the radioactive gear is rapidly detected with accuracy in the circulating oil, by means of a Geiger or scintillation dip counter, ratemeter, and chart recorder. A loss of as little as 1/100 of a milligram of metal into the oil is detectable with this apparatus.

Without the radioactive method, time-consuming equipment disassembling, cleaning, and weighing, or else time-consuming analysis of the oil for metal content would be required. The distribution on an inactive gear tooth of the metal transferred from the radioactive gear to the non-radioactive one may be shown graphically and quantitatively by autoradiographing one of the inactive gear teeth.

Such autoradiographs yield considerable information about distribution of load and the occurrance of scoring. Similar studies have been carried out with radioactive piston rings gy Atlantic Refining Co., California Research Corp., and Shell Petroleum Co. (England).

For petroleum refining, a number of interesting reaction mechanism studies of hydrocarbon alkylation, isomerization, and hydrogen-transfer reactions have been carried out by use of radioactive tracers. For example, an investigation at the University of California of the sulfuric acid-catalyzed alkylation of isobutane with butene, employing tritium-labeled sulfuric acid, revealed the rapid exchange of hydrogen atoms between the butene and the acid, as contrasted with a much slower exchange of hydrogens between the isobutane and the acid. The aluminum chloride-catalyzed isomerization of butane to isobutane has been studied by the California Research Corp., employing tritium-labeled butane, isobutane, and hydrogen chloride.

Frequently in distillation processes one encounters the troublesome problem of entrainment of droplets of kettle bottoms in the overhead vapor stream, causing undesirable contamination of the overhead product. In a radioactive entrainment study carried out at Shell Development on an aqueous distillation system, a small amount of phosphoric acid labeled with radioactive phospherous was added to the feed, and samples of the overhead product and kettle bottoms then counted for content. It was readily established that the degree of entrainment in the distillation unit amounted to only 0.0019%.

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Pump house in Ohio, 6′ 8″ wide by 8′ long.

Plating plant in Pennsylvania, 28′ wide by 72′ long.

Multiple-span plant in Montana, total width 104′ by 162′ 8″.

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Armco Buildings are preferred for industry because they are: quickly available and easy to erect; economical yet attractive; durable in permanent installations yet permit dismantling and re-erection at new sites without loss of material.

Your Armco Buildings will need little or no maintenance. They are wind- and weather-tight. There's nothing to crack, warp or rot. And steel won't burn. Write for data.

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ARMCO STEEL BUILDINGS

OPTICAL PROCESSING at Northrop

ULTRA-high-precision glass surfaces accurate to within millionths of an inch are being produced at Northrop Aircraft Co.'s Anaheim, Calif., division for U. S. Air Force and Army Ordnance Corps projects. The first major national defense contractor in the West to install production equipment capable of this degree of accuracy, Northrop-Anaheim glass processing operations were begun in May 1954 and expanded this year to a total of 12 grinding and polishing machines, with a combined capacity of 29 spindles. Current production includes lenses for an optical radar plotting board, tooling optics for test fixtures used to inspect opto-mechanical range finders under modification at the plant, and large glass surfaces for use in guided missile project.

EXPLOSION SHELTERS

COMBINATION explosion shelters and smoking areas, made of Armco multi-plate pipe arch, are T-shaped with an inner room that can hold 30 people comfortably. These 40-ft. tunnel-type shelters at Aerojet-General Corp.'s Solid-Propellant Manufacturing Facility near Sacramento, Calif., consist of elliptical sections with central adits covered with fill and situated at a maximum safety angle from possible blast sources. Floors are concrete and each shelter has an overhead clearance of 105 in.

REEVES

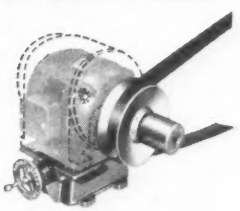
Vari-Speed Motor Pulley

Smaller Units! More HP!

Completely new redesigned line from ½ to 15 HP!

NEW

"spiral-groove" lubrication



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3. One-point lubrication. Unit can be lubricated when stopped, or *while in operation.*
4. Superior base construction provides greater rigidity and strength, reduces vibration and noise.

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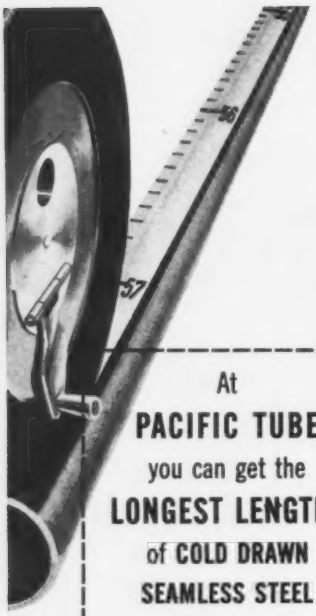

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A BRACKET is welded to a hydraulic cylinder which is rotated under a mounted sigma welding torch.

New jacks sigma-welded

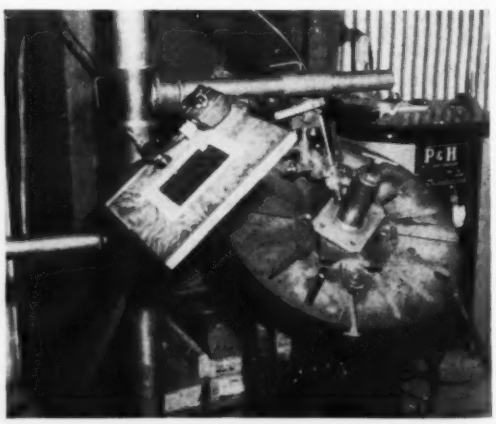
Argon gas blanket protects weld area while rotating under the torch

SIGMA welding is being used to speed the fabrication of heavy-duty hydraulic aircraft jacks by Regent Jack Manufacturing Co., Downey, Calif. It is estimated that the jacks, used in the assembly of large cargo planes, are sigma welded in less than half the time required for metallic arc welding.

The jacks have a maximum extended height of 16 ft. 8 in., with a lifting capacity of 30 tons. A hand-operated hydraulic pump attached to one of the three legs provides a pressure of 2,750 psi. to the lifting head. All components of the jack are SAE 4140 heat-treated steel tubing ranging in size from 3 in. O.D. with an 11/32-in. wall, to 7 in. O.D. with a ¾-in. wall thickness. Except for the caster wheels, the jack is 100% sigma welded.

A Linde SWM-2 sigma welding torch in a simple holding fixture is used to weld the various tubular parts. The larger pieces are rotated on a roller equipped jig under the torch during welding. A blanket of inert argon gas covers the weld area, protecting it from contamination by the air. Welding speed ranges from 20 to 60 in. per minute with as many as five passes being used to complete some of the welds, depending on the wall thickness of the part being welded.

Small sub-assemblies, like caster wheel bases, are welded by the same method, but are mounted on a positioner. All welds are made with 1/16 in. Oxweld No. 32 CMS wire, and M5 sigma grade argon gas flowing at a rate of 40 cu. ft. per hour. The completed welds require no finishing.



SMALL UNITS are welded at speeds up to 60 in. per minute at another fixed sigma welding torch.

Fact:

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TIME CUT
in vacuum processing

VACUUM processing of tomato powder was recently reduced from a two-step operation to a one-step operation during experiments at Western Utilization Research Branch of the U. S. Department of Agriculture in Albany, Calif.

A two-step process has previously been used to overcome difficulties imposed by the hard glassy quality obtained in tomato concentrate vacuum puffing. Pulp was separated from single-strength tomato juice in a centrifuge and then concentrated under low-temperature vacuum to about 60% solids. After these two operations the materials dried readily in a vacuum chamber and crushed easily into a powder form.

To avoid the two-step process the laboratory workers tried beating air into whole tomato concentrate to the point of a meringue-like consistency, and then dried it under vacuum. This one-step process produced suitable material for powder. From the cost standpoint, the one-step process is practical and promising when concentrates containing 25 to 38% of solids are used.

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FLUID COKE
used to supply power

FLUID petroleum coke was used recently as a fuel in Kaiser Co.'s Permanente Cement plant, Permanente, Calif., successfully supplying power for full operating capacity. The new fuel is a petroleum product which converts low value, heavy residual oils into more valuable lighter oils.

Kaiser Engineers received the coke material for their fuel test at Permanente from Carter Oil Co.'s new fluid coking unit at Billings, Mont. The coke-producing process is a recent development of Esso Research and Engineering Co.

CONTAINERS REUSED

USE OF Comex containers to carry small parts overseas has been expanded to include outbound shipments of small items of all Army technical services, the Air Force, and PX items. Upon unloading at overseas points, the containers are used as parcel post carriers for stateside shipments of mail.

Loading and unloading of ships is speeded up through use of the containers. Previous method was to place individual packages on sling pallets and then load them individually in 'tween deck space. The containers used have an interior cube of 295 cu. ft. and a maximum pay load of 9,000 lb.

GENERAL METALS
elects King

GENERAL METALS Corp. elects Arthur F. King to its board of directors. Mr. King is founder and former

Arthur F. King

president of King Publications of San Francisco, publishers of WESTERN INDUSTRY, WESTERN CONSTRUCTION, and WESTERN FARM EQUIPMENT; also, a director and vice chairman of National Business Publications, Inc., of New York and Washington. He is a member of the Committee on Business Organization of the Department of Defense, one of the task forces of the Hoover Commission.

EFFICIENCY KINKS

MACHINIST'S IDEA
increases boring mill capacity

ALBERT MARCHESE, a machinist at Westinghouse Electric Corp., Sunnyvale, Calif., received $1,936, the highest suggestion award ever presented to a Pacific Coast Westinghouse employee, for a suggested change in vertical boring mill which makes it possible to machine larger castings.

Large castings, such as 20,000-kw. turbine cylinders, had to be machined on a horizontal boring mill due to the limited capacity of the Betts vertical boring mill. The horizontal boring method is a more costly operation than the vertical.

Problem solved

Mr. Marchese suggested a change in the locations of all electrical boxes and wiring that previously were located on the rail of the Betts boring mill. This permitted going up higher with the rail and allowing the 20,000-kw. turbine cylinder to enter.

Machining on the vertical mill, after changes, improved the quality and was done in about one third the time required by the horizontal method.

Earlier suggestions given Westinghouse by Mr. Marchese have earned him a total of $340.

PLANT PAINTED
without production delay

PAINTING of a factory building at Rohr Aircraft Co., Chula Vista, Calif., is being done without delaying the plant's production through the use of a unique scaffold designed by the Rohr maintenance department.

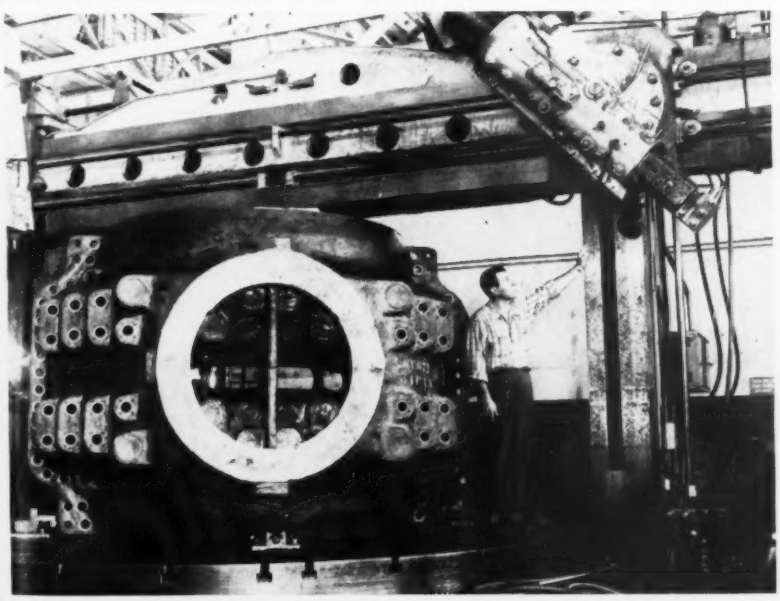
Suspended from the ceiling by a series of iron straps to which pot logs are attached, the solid floor of the scaffold consists of framework sections of plywood. The scaffold is comprised of six moveable sections which are readily shifted to new working areas.

BEARING CHANGE
insures boiler tubes

RUSSELL W. WRIGHT, auxiliary tender at Zuni Station of the Public Service Co. of Colo., suggested a bearing change to prevent possibility of costly boiler tube damage. His suggestion netted him a reward of a $25 bond.

The idea was that the present agitating paddle bearings of the Nalco water treating tank be replaced with lignum vitae (a hardwood) bearings to reduce maintenance and prevent oil leakage into the boiler feed water. This leakage is usually damaging to boiler tubes.

SUGGESTION that all electrical boxes and wiring located on the rail of this Betts boring mill be moved to allow a 20,000-kw turbine cylinder to enter won Albert Marchese, Westinghouse Electric Corp. machinist, a $1,936 award. Piece was previously milled on a horizontal mill.



Contributions wanted

For each contribution to Efficiency Kinks which the editors feel merits publication, WESTERN INDUSTRY will be happy to award $5.00. Please send in any details of how your plant solved some problems of design, production, maintenance, or process.

We are particularly interested in ideas that contribute to the efficiency of production and the reduction of operating costs, novel or new methods of pollution reduction and waste utilization, as well as adaptation of old tools and processes to do new jobs.

Send contributions to Efficiency Kinks Editor, WESTERN INDUSTRY, 609 Mission Street, San Francisco 5, Calif.

AUTOMATIC WASHER
for bearing races

ASSEMBLY of the delicately balanced compressor rotor of the Mars generator set at Solar Aircraft Co., San Diego, requires continual checking of shaft bearing dimensions. Bearings must be exact to fractional thousandths of an inch. They are lapped down by degrees in silicon dioxide and checked on an electrolimit gage, being washed between operations in a solvent.

Washing was once a laborious process, done with a hand-held jet spray nozzle over a sink. However, Nicholas Nazad, an assembler in the gas turbine assembly department, found a new and simple way to do the job. He cut the bottom of an empty foam shave can, ran two small jets up inside bearing at 20 deg., and he had an automatic washer. Now, the man who was once tied to a washing hose can insert the race, turn the valve, and let the washer do its work.

Mr. Nazad's suggestion of an automatic washers for bearing races took fourth place in Solar's suggestion awards system. Awards are given quarterly to workers providing the best suggestions. Mr. Nazad's brought him $30.

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West's metal show tops all records

Tool engineers' convention also well attended

THE Ninth Western Metal Congress and Exposition held in Los Angeles in March topped all records for quantity and character of attendance and for excellence of program. Program and show committees and the national secretary of the American Society for Metals, Wm. H. Eisenman, are receiving due congratulations. More allied societies participated than ever before.

Preceding it by two weeks was the American Society of Tool Engineers national convention and show at Shrine Auditorium, the first appearance in the West for ASTE. Its meetings and exhibits were also well attended.

ASM papers presented included the following information:

Numerous critical aircraft and missile parts currently are being brazed with boron-chromium-nickel alloys. Adverse comments consist mainly of: poor flow of the brazing alloy, poor joint penetration by the brazing alloy, large skulls or unmelted residue, and excessive erosion of the joint by the brazing alloy. The invariable cause of these difficulties is poor equipment, poor procedure, or both.—*George C. Driscoll, Western Alloy Engineering Co., Montebello, Calif.*

Delayed failure in steel definitely has been correlated with the presence of hydrogen. It has much in common with fatigue failures, the principal difference being that a large number of alternately applied stresses may not be necessary.—*Dr. Alexander R. Troiano, head of metallurgical engineering department, Case Institute of Technology, Cleveland, Ohio.*

It is possible now to establish practical operating limits for carbon and alloy steels for all degrees of severe service in refinery hydrogenation processes.—*G. A. Nelson, staff matallurgist, Shell Development Co., Emeryville, Calif.*

It is believed that porosity in welds is due to entrapped gas, which may originate either from excess water vapor carried in the shielding gases or from evolution or dissolved gas from the parent metal. The high strength to weight ratio in aircraft construction holds true for construction of liquid-propellant rocket power plants, with the additional requisites of ductility, high temperature serviceability, and resistance to corrosive environments.

Substitution of helium for argon,

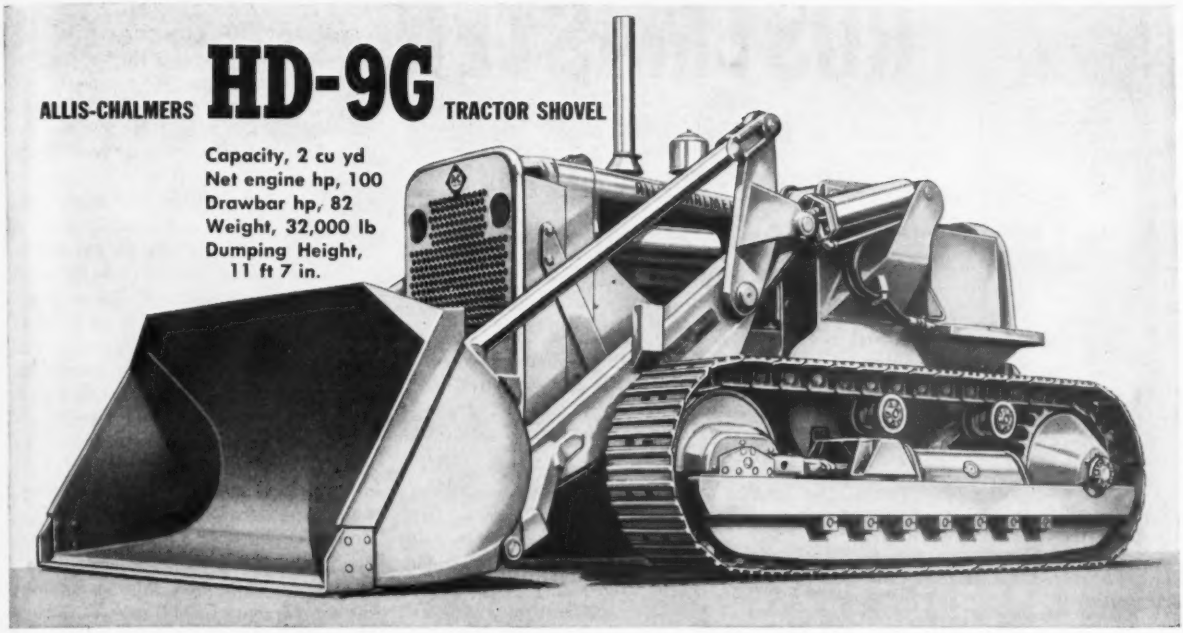
Plastic tooling

PLASTIC tooling's cost-cutting advantages in the aircraft and automotive fields have just begun to be realized, it was reported at the panel discussion on the subject held at the American Society of Tooling Engineers national convention in Los Angeles in March.

"The hardest surface is not necessarily a mark of the toughest material," said John Delmonte, general manager of Furane Plastics, Inc., of Los Angeles. "Maximum toughness is achieved by using glass cloth to reinforce the plastic material. Light weight of plastics and the ease and speed of their preparation give them definite advantages in many tooling applications."

Quickness of making engineering changes in plastic tools is an advantage in eliminating production tie-ups, according to Louis E. Frost, tool engineer, North American Aviation, but plastic tooling is not a cure-all.

A program for standardization for plastics should be developed, urged George C. Adams, staff engineer, Rezolin, Inc., Los Angeles. "It is not surprising that a certain amount of confusion, misinformation, and misapplication of plastic tooling exists because of the newness of the development."

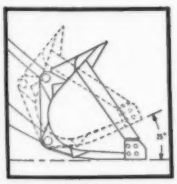


POPULAR 2-YD HD-9G TRACTOR SHOVEL NOW OFFERS

Higher Work Capacity

Design refinements in the Allis-Chalmers HD-9G now make it even more productive than ever. First, the net engine output has been increased to 100 hp, with 23,000 lb of push for extra crowding and digging ability, fast work cycles.

Streamlined bucket design now helps roll in large loads with less tractor effort. The back of the bucket has been brought forward and the sides extended to cut spillage, put more pay load where it's wanted. Cleaner dumping with the new bucket saves the operator time and effort shaking out loads.



A new addition to the wide variety of attachments available for the HD-9G Tractor Shovel is the Tip-Back bucket which allows the operator to roll the bucket back approximately 25° at ground level. Ideal for handling greater capacities of loose stockpiled materials, the Tip-Back bucket can be carried lower to the ground for greater stability . . . can load bulky objects easier.

New-type ceramic master clutch lining reduces lever pull, makes it easier for the operator to do more. The new HD-9G helps the operator do more in other ways, too — giving him full vision, fast and easy control, cleaner platform and more comfortable seat from which to work, and more working time with truck wheels, support rollers and idlers that need greasing only once every 1,000 hours.

Lower Operating Cost

Design improvements also add longer life to the HD-9G under all work conditions. Heavy box-section booms are 50 percent stronger, assuring proper alignment even working in the toughest materials. The low design of the new HD-9G combination stabilizer and cowl not only offers easy accessibility for maintenance and service, but contributes to maximum operator vision. New ceramic master clutch lining operates longer between adjustments, increases clutch life.

Hydraulic system provides new maintenance simplicity, safety of operation, as well as improved visibility. With new-style tank, there are few external fittings, greatly reducing possibility of outside leaks. Magnetic filters and suction-line screens protect the entire system from damaging grit. New, improved hydraulic pump is designed for long life as well as fast and accurate bucket action.

Heavy-duty truck wheels and idlers are available for particularly tough working conditions. One-piece, full-length main frame permits unit construction so that major assemblies can be removed without disturbing adjacent units, putting tractor back on the job in hours rather than days.

☆ ☆ ☆

See your Allis-Chalmers dealer for further information on what the HD-9G can do for you — or a demonstration right on your job.

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RUSTMASTER

Absorbs Old Rust

Prevents New Rust Forming

Provides long-lasting protective prime coat for ferrous metal surfaces.

To cut maintenance and replacement costs, use this powerful rust stopper on machinery, metal doors, windows and roofs, towers, elevator cages, structural steel, water towers, tanks, truck bodies, fences and scores of other metal surfaces exposed to fog, smog, rain, corrosive fumes and humidity.

Rustmaster literally absorbs old rust by penetrating right down to metal underneath. There it forms a tight bond that prevents new rust from forming on either old or new surfaces. Many Rustmaster users report protection against rust damage for 10-15 years.

Reduces out-of-use time

Rustmaster saves labor and plant shutdown time, too, because you can apply it without costly sandblasting or pre-cleaning, wherever such preparation is impractical. Just remove loose rust and scale with scraper or wire brush, then brush, dip, or spray on Rustmaster. It dries dust free in about 1 hour, dries to handle in 4 to 6 hours; is ready to re-coat in 18 to 24 hours. Once applied Rustmaster won't crack, chip or peel.

Why let rust destroy metal structures and machinery? Apply RUSTMASTER now.

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with appropriate changes in carriage speed and current settings, reduced porosity from five pores per inch of weld to zero pores per inch.—*C. W. Funk, metallurgy group leader, Aerojet-General Corp.* and *M. J. Granger, metallurgist, Wall Colmonoy Corp. (both of Azusa, Calif.).*

Where it once was considered adequate for aircraft and missile parts to use a steel in the 50,000 psi. yield (or breaking) class, 100,000 pound minimum yield strength is the requirement. "Thought now is being given to using material with yield strengths as high as 175,000 psi. minimum. The automatic welding of these steels presents a serious problem to meet production requirements in time for an emergency.—*B. Roberts, supervisor, welding and metallurgical laboratory,* and *W. A. Saylor, chief metallurgist, Consolidated Western Steel Division, U. S. Steel Corp., Los Angeles.*

Titanium fills the vital gap between the temperature of 300 deg. F., where aluminum begins to get limp, and 1,000 deg. F., where titanium itself begins to lose strength and stainless steels take over—*Dr. Walter F. Finlay, vice president and manager of research, Rem-Cru Titanium, Inc., Midland, Pa.*

North American Aviation has been producing titanium airframe parts for the last four years, and at present uses large quantities of both pure and 8% manganese alloy titanium sheet in production of the F-100 fighter ship. The major cause of failure in assembling titanium is sheet gap due to poor fit. Small discrepancies must be shimmed to provide as perfect matching of details as possible. Scratches and notches in general are a contributing cause of failure.—*W. T. Kluge, production metallurgist, North American Aviation, Inc., Inglewood.*

Small high-temperature alloy castings for aircraft jet engines now may be X-rayed for internal defects at the rate of several thousand a day and at a cost of less than a three-cent postage stamp.—*E. Alfred Burrill, director, technical sales, High Voltage Engineering Co., Cambridge, Mass.*

JOINT MEETING

THE Structural Engineers Society of Northern California and the Golden Gate chapter of American Welding Society are holding their first joint meeting at the Engineers Club in San Francisco May 23. Topic will be new specifications and practices for structural welding, the speaker La Motte Grover of New York, Air Reduction welding engineer from New York.

SCIAKY STUDIES resistance welding

THE West has been chosen for another research center. This one, to specialize on resistance welding and related problems, is believed to be the first of its kind in the country. It has been established in West Los Angeles by Sciaky Bros., Inc., largest manufacturer of this kind of welding equipment, which has plants in Chicago, London, and Paris.

Location of the research center on the West Coast was considered necessary because of the immense amount of research and development being undertaken by the aircraft and electronic industries in this area.

Part of the work will be on specialized application problems, but more significant will be the study of resistance welding and its behavior with various metals, the variations in conditions such as those imposed by ultrasonic speed and thermal conditions, low and high pressures, fatigue tension, and impact stresses. Development of adequate instrumentation for resistance welding research, service, monitoring, and inspection is also part of the program.

Mario Sciaky, one of the four brothers operating the company, and who has been in charge of European operations, will head up the research staff. Resistance welding is reported to have lagged behind other types in respect to the amount of information that its equipment manufacturers have been able to supply to designers and fabricators, and establishment of the laboratory will help close up the gap.

WELDING research center's spot welder is said to be the world's largest.

MILITARY PRIME CONTRACTS

THE WEST had 20.2% of the military procurement and construction contracts awarded in the United States from July 1950 through September 1954, a total of $21,931,422,000.

California ranked second in the nation, $16 billion as against New York's $17 billion, and almost double the third state, Michigan. Washington ranked seventh. In Air Force contracts, California led with almost $8 billion, and Washington was third with nearly $4 billion.

Figures are as follows, in thousands of dollars:

California	$16,167,691
Washington	4,590,966
Oregon	290,610
Arizona	280,027
Colorado	219,011
New Mexico	123,474
Utah	91,593
Nevada	58,833
Idaho	55,993
Montana	30,565
Wyoming	23,059

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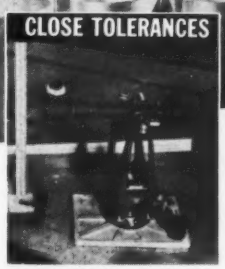
MACHINING

Big Tools Big Work

Today's demand for machining of larger weldments, castings, and forgings requires the use of massive, expensive machine tools. If size is your problem, Moore's machine tools are your economical solution.



Use of optical measuring instruments demonstrates the ingenuity and care Moore employs to assure accurate workmanship.

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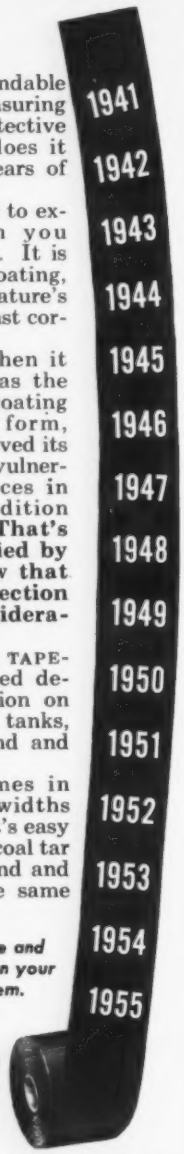
Since 1941, when it was introduced as the first protective coating in handy tape form, TAPECOAT has proved its ability to keep vulnerable steel surfaces in "like new" condition year after year. **That's why it is specified by those who know that continuing protection is the first consideration.**

For 14 years, TAPECOAT has provided dependable protection on pipe, pipe joints, tanks, etc., above ground and under ground.

TAPECOAT comes in handy rolls in widths from 2" to 24". It's easy to apply and the coal tar provides both bond and protection at the same time.



Write for brochure and recommendations on your corrosion problem.

The TAPECOAT Company

Originators of Coal Tar Tape Protection

1563 Lyons Street · Evanston, Illinois

NORTH AMERICAN'S new shuttle unit is used in conjunction with a 4,500-ton press.

SHUTTLE UNIT
greatly speeds up rubber forming

RUBBER forming has been greatly speeded up at North American Aviation's Los Angeles plant by a specially-designed shuttle unit, nicknamed the "Merry-Go-Round Shuttle Table."

Used in conjunction with a 4,500-ton press, it has reduced operating personnel 50%, increased the working time of the operators, and also operates much faster than previous units. The transfer time of forming platen from standby to forming position is 5 seconds and complete cycle time of the unit is 19 seconds. Safety hazard potential of the forming operation is cut 80% through use of the new shuttle.

The unit is mounted on casters and can be taken apart and removed in only two hours to free the press for other operations if necessary. Besides the unit now in operation, North American has another near completion and a third in the design stage, both of different sizes than the original.

Designer of the shuttle table precision control unit was N. A. D'Arcy, design engineer, in conjunction with members of North American's machine forming department.

PREPAREDNESS INSURED
by new production layaway scheme

IF ANOTHER WAR should break out tomorrow, the Army Ordnance Corps hopes to insure the production of defense materials within 90-120 days under the layaway program now being installed in the plants that turned out guns, tanks, and ammunition for the Korean conflict.

This layaway program is the Army's answer to the hard lessons learned in Korea when 6-18 months elapsed before industry could turn out new weapons. Under this program defense manufacturers promptly clean, preserve, and store the gages, jigs, dies, fixtures, tools, etc., used in the production of critical defense items at the close of their contracts.

Whenever possible, production equipment, together with essential pilot materials, is left in place or stored at or near the plant where it will be used in event of an emergency.

All the equipment needed to produce an item remains under the control of the contractor. His organization is familiar with it, knows its maintenance, and how to operate it when the need arises. If maintenance by the contractor is not feasible, the government will store the tools at some central site.

In the Bay Area, according to Colonel John M. Stark, Commanding Officer of the San Francisco Ordnance District, a layaway contract has already been signed with General Metals

Corp. Foundry, Oakland, manufacturer of steel castings for the Army.

Another is in negotiation with Columbia-Geneva Steel Foundry, Pittsburg, tank hulls producer.

Layaway plans are also under consideration for Rheem Manufacturing Co.'s San Pablo plant, producer of mortar and chemical shells; Albert Wright of Oakland, manufacturer of ammunition boosters and 20 mm. projectiles; Norris-Thermador Corp., operator of the giant $60,000,000 government steel cartridge case plant at Riverbank; and Food Machinery & Chemical Corp., San Jose, armored personnel vehicle manufacturer, if and when their present Army contracts are concluded.

Other companies with whom the District may conclude layaway agreements when production might cease include Hall-Scott Motors, Oakland, producer of 90 mm. cartridge cases and 105 mm. howitzer recoil mechanisms; Yuba Manufacturing Co., Benicia, maker of the 155 mm. howitzer; and Be-Ge Manufacturing Co. of Gilroy, now making 76 mm. guns for the Army.

In the Pacific Northwest, a layaway contract has been negotiated with Kenworth Motor Truck Corp., Seattle, Wash., who designed and built the T10 transporter for the 280 mm. gun or atomic cannon.

Similar arrangements may also be made in the Northwest with Pacific Car and Foundry, Renton, Wash., producer of self-propelled artillery vehicles; Skagit Steel and Iron Works, Sedro-Wooley, Wash., 105 mm. cartridge case producer; Columbia Electric and Manufacturing Co. of Spokane, Wash., manufacturer of ammunition boosters, 20 mm. projectiles, and 60 mm. mortar shell fins; Screw Machine Products Co., Portland, Ore., supplier of ammunition boosters and rifle grenades; and Speer Cartridge Works, Lewiston, Ida., manufacturer of electric primers and primers for .45 caliber cartridges.

The layaway program of the Los Angeles Ordnance District includes the following projects: Clary Multiplier Corp., San Gabriel, has a plan in progress; Harvey Machine Co., Torrance, has a layaway contract under negotiation; Hunter-Douglas Corp., Riverside, has one contract signed and another under consideration; Kwikset Locks, Inc., Anaheim, is considering two projects; Mission Appliance Corp., Whittier, will sign a contract shortly; Northrop Aircraft is considering a project covering five production lines; Thermador Electrical Manufacturing Co., Los Angeles, has a project under consideration.

Richards-Wilcox NEW "460"

Continuous Power Chain Conveyor

With a capacity of 8½ lbs. on six-inch centers or 17 lbs. per lineal foot and a 200 lb. draw bar pull, R-W "460" offers safer, more efficient handling of light loads. Exceptionally flexible and versatile . . . lighter load limits . . . and minimal engineering and structural requirements make it extremely economical. It is recommended as a supplementary conveyor unit in production lines and to facilitate movement and handling where the use of drying ovens, washers, paint sprayers, de-greasers and similar operations are involved. Available up to 200 ft. maximum lengths *only*.

Completely packaged and shipped from stock.

R-W "460" Conveyors are completely packaged in easily handled units. Orders to fill any requirement up to the 200-foot maximum are readily filled from stock. For complete information write for descriptive catalog number A-96.

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Elwell-Parker specifically designed the new "Cargo Scout" for *greater maneuverability* . . . It features 360° steering and 57″ turning radius. Telescoping uprights provide 100″ of lift . . . This 2,000 lb. capacity fork truck is noiseless and can be operated for pennies per day because it is *Electric Powered.*

For further information write Ira G. Perin Co., 575 Howard St., Dept. W, San Francisco 5, Calif.

West Coast Representative
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ONE-STEP METHOD freezes car and load

WHEN vacuum retort coolers for preparing lettuce for shipment replaced the former method of merely icing a refrigerator car, it reduced the business of the Goetz Ice Co. of Tolleson, Ariz., to a fraction of its former volume.

Facing this situation, Charles E. Goetz developed a "one-step-further" operation and invested $350,000 in its construction and operation last year. He decided to cool the car, the cartons, and the lettuce all at once.

Early skepticism of his venture has been dispelled by its successful operation and the construction this season of a similar operation at Salinas, Calif., by the Union Ice Co.

The latest innovation in freezing heads of lettuce involves running cartons of lettuce slowly through a vacuum tunnel reducing the temperature to the freezing point. Then the lettuce is loaded on refrigeration freight cars.

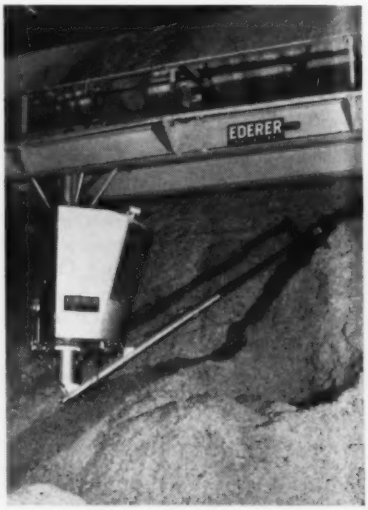
Goetz Ice Co.'s method eliminates conveying the cartons through the tube individually. Cartons are loaded on the refrigeration cars and the whole freight car is backed into one of the two 55-ft. chambers. Five 100-hp. vacuum pumps create a vacuum, reducing temperature of the lettuce to between 32 and 33 deg. F. in less than 24 minutes. Five tons of ice are then loaded into the car bunkers and the lettuce is ready to travel to the most distant destinations without reaching a temperature of 42 deg., a maximum safety point established by previous experiments.

Although cooling of metals and wood of the freight car is involved in the process, twice as many cartons are prepared in less time by this method. There have been no indications that freight cars have been impaired or damaged by the method.

Union Ice's Salinas lettuce cooling operation follows the pattern of the full car method upon which Charles Goetz has a patent pending. Union Ice Co. has been licensed to build and operate this type of precooling facility in California.

NEW method freezes lettuce after loading.

NEW CRANE does two men's work



RAKE operator is protected by enclosed cab.

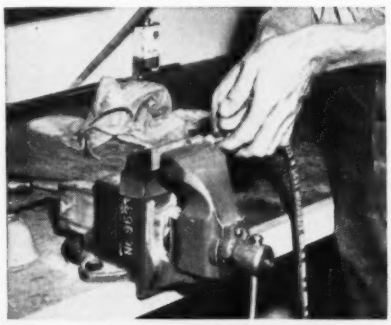
A JOB formerly requiring two men working together to avoid cave-ins of ceiling-high piles of hog fuel at a Weyerhaeuser Timber Co. sawmill is now done with an unusual traveling bridge crane and one operator. Known as a hog fuel rake, engineers at Ederer Engineering Co., Seattle, where it was designed and built, call it the "devil's pitchfork" or the "back scratcher" due to its unusual appearance and action.

The crane operates in a 50 by 120 ft. hog fuel storage building. From 18 ft. above the floor, it breaks down and moves the piles of hog fuel to conveyors that feed the boiler house by means of an oversized "rake." A control cab is suspended from a trolley with a long arm extending out directly beneath it. At the end of the arm is a set of teeth which are operated hydraulically. The cab and rake will rotate through 280 deg.

All electrical parts are fully enclosed. The crane uses a loop type power conductor with no trolley wires or contactor bars to be affected by the constant "snow" of sawdust and hog fuel falling into the storage building from an overhead conveyor. The crane operator is protected by a wide curved molded plexiglas window.

EASE OF ASSEMBLY speeds hose line replacement

at R. W. CRAMER COMPANY, INC., Ballouville, Conn.



Hose assemblies are made by PUSHING the Aeroquip hose on the *SOCKETLESS* fittings . . . and the fittings stay on.

The R. W. Cramer Company specializes in the manufacture of time control instruments. Aeroquip 1525 hose and *SOCKETLESS* fittings are used for air lines for cleaning delicate instrument assemblies.

Factory Manager C. T. Scott says, "We have standardized on Aeroquip for maintenance. The ease of assembly and the reusable fittings speed up installation of air lines."

With Aeroquip *SOCKETLESS* fittings and hose you can assemble fuel, oil, air and water lines fast. Use this time-saving replacement idea in your plant. Complete inventory kit available. See your distributor or write.

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NEW EQUIPMENT AND MATERIALS

FOR YOUR CONVENIENCE the company address follows each item.

Low-cost barrel finishing machine

New VS model barrel finishing machine, latest addition to Honite line, has all moving parts enclosed, and for extra safety, a pivot-mounted gate which closes when machine is in operation and a magnetic brake. Motor, speed reducer, speed changer, and brake are mounted in single unit at the rear for easy maintenance, and cylinder can be removed without disassembling the machine. Available in three power ranges: 1½, 2, or 3 hp. *Minnesota Mining and Manufacturing Co., 900 Fauquier St., St. Paul 6, Minn.*

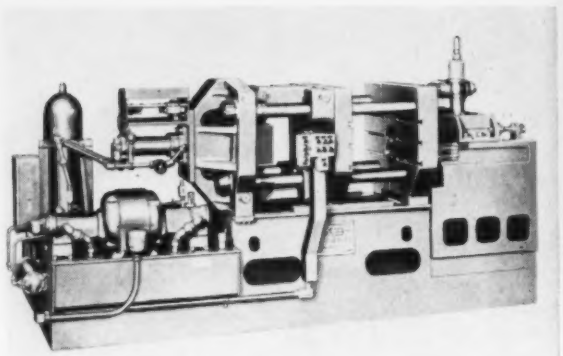
New shell molding system

What is new here is the availability of all process equipment for shell molding and pouring, in what is said to be a fully integrated system, tested and proved in full-scale foundry production by manufacturer. Two men operating the machines can reportedly produce up to 240 molds per hour. Equipment includes a four-station shell molding machine, core setting conveyor, and shell closing machine. Each installation is designed by Link-Belt engineers to suit requirements of that particular foundry. Operations are push-button controlled. *Link-Belt Co., 307 N. Michigan Ave., Chicago 1, Ill.*

Simplified door fitting and hanging

"Three-in-one" builders kit is claimed to make door fitting and hanging ten times faster than by hand. Speed is the result primarily of a hinge morticing template or guide which guides workman in fitting hinges to door and jamb. Kit includes ¾ hp. motor, router base for rapid morticing, and plane attachment for quick fitting of doors. In addition, cutter grinding attachment is provided for sharpening tools on the job. All equipment fits into metal carrying case. *Stanley Works, New Britain, Conn.*

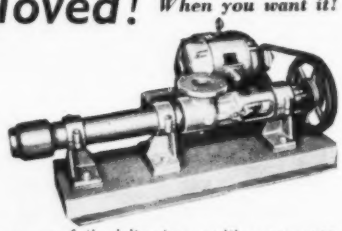
Stepped-up die casting machine

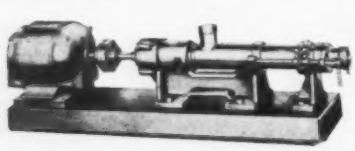


New, more powerful and higher speed design of Model BH-30 die casting machine is offered by Kux Machine Co. New design of machine, a plunger gooseneck type for production of zinc, lead, or tin die castings, gives it an over-all weight of 24,000 lb., providing maximum stability, rigidity, and strength for application of 400-ton rated die clamping pressure. Machine is fully automatic; each phase of die casting cycle is controlled by electric timers. Plunger gooseneck mechanism can be replaced by cold chamber injection unit, converting the BH-30 to production of aluminum, brass, and magnesium castings. *Kux Machine Co., 6725 N. Ridge Ave., Chicago, Ill.*

With Moyno Pumps Material Is Moved! *Where you want it! When you want it!*

NO TYPE LIMITATIONS. The Moyno principle knows no type limitations. Liquids, abrasives, solids in suspension—a Moyno pumps all with equal ease. There's only one moving part, a helical rotor turning in a double helical stator—no delicate vanes, no reciprocating parts, no valves. That's why a Moyno is always on the job where pumping was a problem.





HOW ABOUT YOU? These amazing pumps have solved hundreds of tough pumping problems. If you're interested in good pumping, investigate the advantages Robbins & Myers Moyno Pumps have to offer. They'll stand up where other pumps fail, delivering positive pressures, without pulsation. There's a Moyno for every purpose. Chances are they're just what you're looking for. Why not inquire today?

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WELDING

THIS HOSE HANDLES ALL SEVEN!

Hewitt-Robins SERVALL All-Service Hose is specifically designed to withstand the maximum abuse of *all* the general services, although light in weight and extremely flexible to provide maximum ease in handling. It's a moderate price heavy-duty hose that renders excellent performance in a great variety of services.

The *tube* is smooth, high-quality synthetic rubber blended to exact specifications to resist the highly injurious action of the diversified materials handled in this service . . . the *carcass* is braided, high tenacity synthetic cord impregnated and imbedded in synthetic rubber which provides maximum strength with minimum bulk. The *cover* is long wearing, tough synthetic that withstands gasoline, oil, weak inorganic acids and alkalies. It also resists weathering, sun and abrasion. This hose comes in sizes from ¼" x 1 braid to 1½" x 3 braid with maximum working pressure from 200 to 300 lbs. and lengths in 500' bales or cut to specification.

Excellent records have been established universally by the Hewitt-Robins Servall® All-Service Hose in the following services.

WATER SERVICE: Hot or cold under severe operating conditions in industrial and other heavy-duty applications.

MILD CHEMICALS: For weak inorganic acids, alkalies, and salt solutions, Ethyl, Methyl and other alcohols.

AIR SERVICE: For *all* types of air tools, air cleaning and general air service.

SPRAY SERVICE: For most insecticides and many oil base weed killing solutions, for paint spray (not lacquer) service in home and shop.

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PROPANE AND AMMONIA VAPOR: For low pressure service as used on agricultural applicators and LPG vapor lines.

WELDING HOSE: For heavy-duty single line service with flame and ozone resistant cover.

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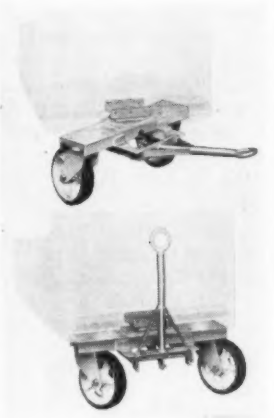
New mounting for caster wheel

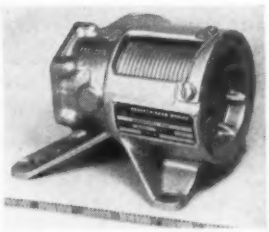


Bronco-Forbes swinging axle is a new mounting assembly which offers advantages of axle controlled steering for caster wheels. In operation, when the steering arm is down in towing position, wheels are locked in pulling position and directed by control of axle (above right). When steering arm is up, axle is locked in position on truck and wheels are released for full caster type operation (below right). Advantages are: increase in travel speed, prevention of damage to wheels from jarring, full control of vehicle when towed downgrade. *Bronco Products Co., 717 Stanford Ave., Los Angeles*

Light-duty gravity conveyor

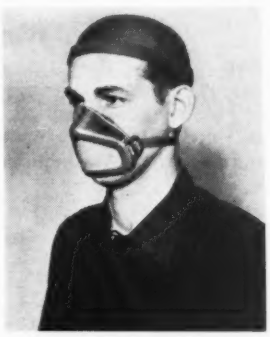
New 1¾ in. roller conveyor series is rated to carry light loads of either mixed or uniform packaged goods, such as boxes, crates, drums, cans, and kegs. Sections can be used in conveyor lines with standard Rapid-Wheel and Rapid-Roller models. Roller spacings of 2, 3, 4, 6, 8, and 12 in. are available in 12 or 18 in. frame widths. For further details, write *Rapids-Standard Co., Inc., Grand Rapids 2, Mich.*

Airborne hoist is hand operated



This 4.75-lb. hoist permits one man to lift 1,000 lb., as shown at right. Reeling capacity is 22 ft. of 3/32 cable. Hoist can be driven with a standard ⅜ hex socket speed wrench. Ratio is five turns of input for one revolution of drum, providing maximum pull-off angle of 12 deg., with installed weight of 4.75 lb. *Western Gear, Lynwood, Calif.*

Light-as-a-feather paint mask



New Flex-A-Prene paint mask, which weighs one ounce, utilizes a new filter material, Prenex, said to be unaffected by paint pigments or solvents even after hundreds of hours exposure. Its long life cuts down time ordinarily lost to replace filters. Manufacturer states mask is comfortable to wear and easy to talk and breathe through. *Flexo Products, Inc., 1468 W. Ninth St., Cleveland 13, Ohio*

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If you're a man who likes to cut corners, this handling equipment manual is for you. It's packed with practical ideas for handling and moving products or materials in light-weight Kennett Receptacles—faster, at lower cost.

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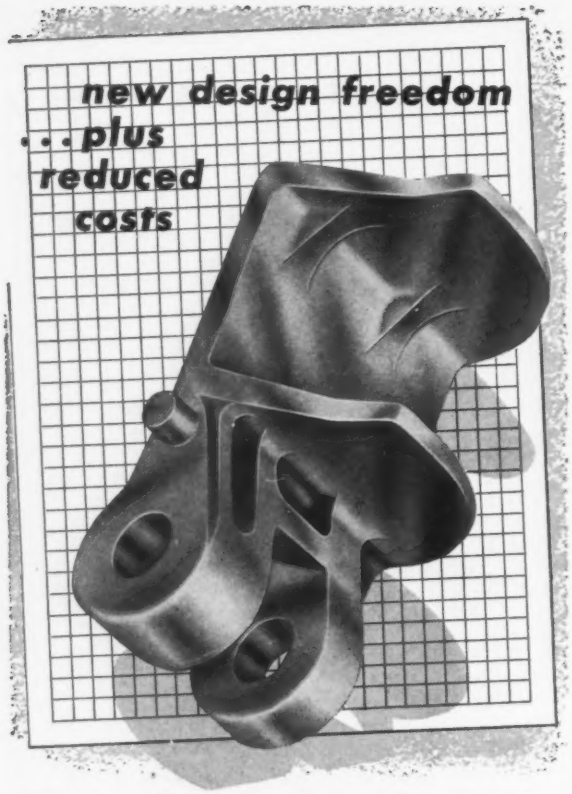

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The Arwood investment casting process permits great design freedom. Many former sub-assembly jobs are now being designed as single-unit castings, with complicated parts being cast in unmachinable alloys. Applications are virtually unlimited.

Our engineers will be pleased to go over your parts problems with you and help cut your own costs. Why not submit parts or prints to us for quotations? Consultation is free of obligation, of course.

Write for free literature describing the investment casting process.

CASE STUDY

DESIGNATION: Female Hinge

METAL USED: Stainless Steel (AISI 302)

QUALITY CONTROL: Chemical and physical affidavits furnished. Test Bars submitted. Produced with 100% X-Ray requirements.

PARTS: Designed and cast as single unit. Formerly composed of three units welded together.

ADVANTAGES: Strengthened with re-inforcing ribs in U-Bracket. Weight decreased without decrease in strength. Reaming holes only machining required. Formerly holes countersunk outer sides only, now cast with radii on both inner and outer sides. Greatly reduced cost.

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NEW EQUIPMENT

. . . Begins on page 66

Radio-wave controlled

Guide-O-Matic truck or tractor requires no operator or physical connection for its operation but is controlled by radio waves that are transmitted over guide wires strung from the ceiling or laid in a slot in the floor. Load moves at any speed desired to any station which signals it, following route set by guide wire. For further information, write *Barrett-Cravens Co., 628 Dundee Rd., Northbrook, Ill.*

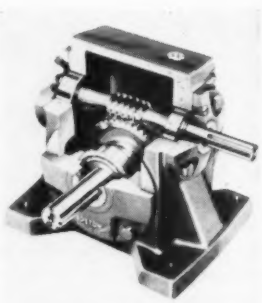
Sprayed foam

Poly-Cell is a new insulation material which is sprayed like paint and in a few minutes foams to 20 times its original thickness. A resinous liquid, it can be sprayed near flames with safety, and will not support combustion when dry. Outstanding advantage is speed at which irregular surfaces can be insulated, without cutting and fitting and fastening. It is said to adhere to any type of clean, dry surface and also to moist surfaces. *Insul-Mastic Corp. of America, Oliver Building, Pittsburgh 22, Pa.*

For converting Clarks to LP-gas

Gas-powered Clark fork trucks can now be adapted to liquified petroleum gas power through installation of conversion kit recently made available. Kit includes same components used in LPG models built at Clark's factory and is UL-approved. Conversions can now be made on Clipper, Carloader, Yardlift 40, and Utilitruc models; kits for other models will be available soon. *Clark Equipment Co., Battle Creek, Mich.*

New units for speed reduction



New 100 Series reductors are standard stock gear reduction units made in a full range of models and ratings. Compact design and improved worm gearing provide greater load carrying capacity with less weight and less space. Available in 52 standard stock models—283 different units with ratios from 5:1 to 3600:1, and output torque ratings from 40 in. lb. to 9,400 in. lb. *Boston Gear Works, Quincy, Mass.*

complete line of HEAVY-DUTY cords helps you

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Now—Anaconda introduces new portable cords with rugged construction . . . peak performance . . . and top flexibility for 3 types of service!

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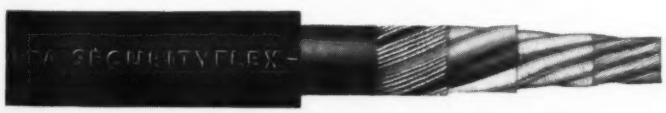
Select the cord *best suited* to your needs—based on good engineering and sound economics.

Whichever cord you choose, the Anaconda trademark is your assurance of *premium performance.*



SECURITYFLEX—Underwriters' approved Types SO and SJO.

SECURITYFLEX* CORDS for severest conditions. Toughest, sturdiest cords made . . . used where strength and wear-resistance are a "must." Neoprene jacket *mold-cured in lead* gives top crush, abrasion- and oil-resistance. Cords pay for themselves with long life under severest conditions—in mines, railroads, docks, and in heavy industrial use. Look for the molded-in name, "Securityflex!"

INDUSTRIAL—Underwriters' approved Types SO and SJO.

INDUSTRIAL CORDS for heavy industrial conditions and *maximum flexibility.* Lower in cost. Specially designed for use in heavy industry—where cords are in continuous operation and must be tough, flexible, oil-resistant. Tough neoprene jacket. Many industrials stock this one cord for use in virtually all applications . . . reducing inventory problems and costs. Look for the Anaconda marking on jacket.

SERVICE—Underwriters' approved Types S and SJ.

SERVICE CORDS for regular duty. Lowest in cost . . . yet have many features found only in higher priced cords of other makes. Special rubber jacket withstands abuse and moisture. Outstanding for appliances, office machines, portable tools—where flexibility and long life are needed.

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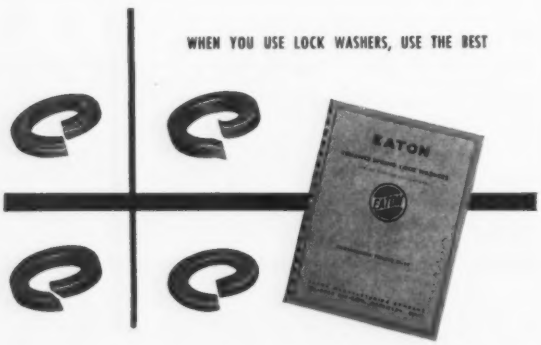
FASTEST WESTERN SERVICE — Anaconda's Western Distributors and expanded and modernized Orange, California, mill which fabricates copper and aluminum wire and cable for *every kind of application* assure West fastest possible service on all needs. See Anaconda Sales Offices: Los Angeles, San Francisco, Seattle.

Designers and production men are well aware of forces constantly exerted in and around assembled parts. They are the reasons behind the universal acceptance of the nut, bolt and lock washer type of industrial fastening. A Reliance Spring Lock Washer has the reactive range and reactive pressure to keep tension in a bolted assembly long after wear, vibration and bolt elongation have destroyed the effectiveness of a less efficient type of fastening. That is why we say Reliance Spring Lock Washers keep bolted assemblies *tighter longer*. For complete information, write for engineering folder W-50. No obligation.



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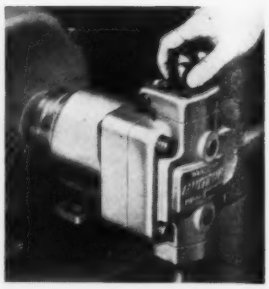
NEW EQUIPMENT

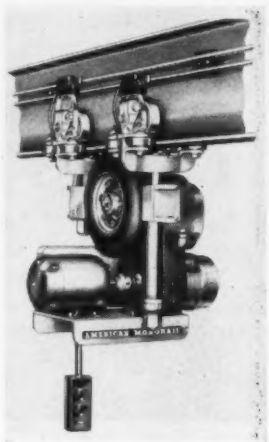
. . . Begins on page 66

Multipump fills many needs



New Denison Multipump for oil-hydraulic applications can deliver variable volume at constant speed or constant volume at variable speed. Some of the advantages claimed are: finger-tip volume control, independent of compensator; a compensator control that works at all volumes; volumes held within plus or minus 5% of desired pressure and designed speed ranges; operation by simple push-pull cable. Available in three basic sizes, with capacities of 5, 15, and 25 gpm. at 1,200 rpm., all designed for 1,000 psi. continuous duty. *Denison Engineering Co., Columbus, Ohio*

MonoRail drive



New drive unit has universal application for automatic or power-propelled load transfer on a monorail track or crane bridge. Traction is obtained by spring-loaded contact of rubber wheel against bottom of any smooth flange track. Power range is from ¼ to 2 hp., speed range from 35 to 350 ft. per min. Unit can use any standard NEMA frame motor and can apply any type motor brake. *American MonoRail Co., 13107 Athens Ave., Cleveland 7, Ohio*

Press Helpers

New line of machines (Series 675-J) for conveying small parts away from production machines and presses features hydraulic ram adjustment at discharge end for accuracy of discharge height, and automatic trap loading. Designed for small parts, the Press Helper can be modified to handle larger parts. Available in standard belt widths of 5, 8, 10, and 12 in., with variable speeds from 30 to 90 ft. per minute. *Metzgar Conveyor Co., 402 Douglas St. N.W., Grand Rapids 4, Mich.*

Jam-proof chain hoist

CM Lodestar, new electric chain hoist, has jam-proof chain guide and non-kinking flexible link chain which make it suitable for extreme angle pulling. Single-phase model without contractor can be used for side pulling. It can also be used upside down for jobs where hoist cannot be installed overhead. *Chisholm-Moore Hoist Division, Columbus McKinnon Chain Corp., Tonawanda, N. Y.*

This forming operation at Gilro Machine & Stamping Co., Oakland, Calif., is typical of applications where it pays to select the one right steel. Beginning in the open hearth, steel from USS is made to do one specific job and do it best at lowest cost.

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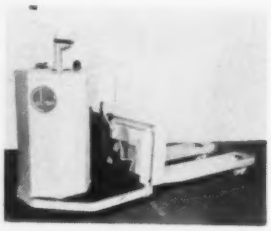
UNITED STATES STEEL

NEW EQUIPMENT

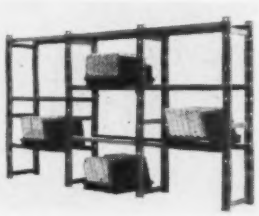
. . . Begins on page 66

New face to Colson Handler



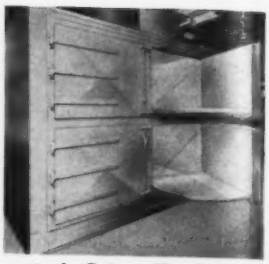
This double-faced pallet type Handler has same performance features as platform Handler introduced in 1954. Controlled by single lever, it has two speeds forward and two speeds reverse and automatically shifts between low and high. Pallets are lifted by raising the control lever. Weight: 1,175 lb. Speed: up to 4 miles per hour. Seven standard fork lengths range between 32 and 60 in. *Colson Corp., Elyria, Ohio*

Adjustable storage racks



Adjustable members of these storage racks may be removed by hand and placed at any desired level. Braces are welded to front and back panel uprights for depth specified by customer. Complete tiering range is possible, using racks in single, double, or multiple sections. *Palmer-Shile Co., 16018 Fullerton, Detroit 27, Mich.*

Four-in-one



Electric oven features four individual compartments 4 x 4 ft. by 3 ft. high, which can be opened independently to change load. New type of door has an integral shelf on which load is placed; when door closes, load is carried inside. Oven is said to have fully automatic operation; air circulation is both horizontal and vertical. *Grieve-Hendry Co., Inc., 1401 W. Carroll Ave., Chicago 7*

Stretcher for steel strapping

Model 48 flat steel strapping stretcher, for 2 in. x .050 flat steel strapping, has been developed to eliminate time-consuming and fatiguing operator effort needed for manually operated equipment. Easier threading is assured by free wheeling of tension drum and locking of frame gripper in open position. Stretcher is easy to remove from strap after completion of tie. Extension handle gives added leverage in tensioning when necessary. Model 50 handles 2 in. x .050 sealer. *Gerrard Steel Strapping Division, U. S. Steel Corp., 2915 W. 47th St., Chicago*

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Acme Idea Man William W. Allen of Denver, worked with The Gates Rubber Company officials on this efficient packaging system.

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The Gates Rubber Company, one of the largest manufacturers of rubber products, not only has enjoyed savings in shipping time and materials for 15 years with Acme Steel Wire Stitching, but also the benefits of increased packaging production. Recent conversion to the new Acme Steel ARCUATE Wire method on Acme Silverstitchers (Idea No. 436) has brought about even further savings . . . with greater packaging and shipping efficiencies as a result. Addition of Acme Steel Strapping, according to the Gates Rubber Company, has produced shipping containers of superior qualities.

Let your Acme Idea Man show you the multiple advantages of Acme Steel Wire Stitching and Acme Steel Strapping as applied to your individual shipping and packaging problems. Call him, or write Acme Steel Company, Dept. HJ-55, 4903 Pacific Blvd., Los Angeles 58, California. Offices also located in San Francisco, Portland, and Seattle.

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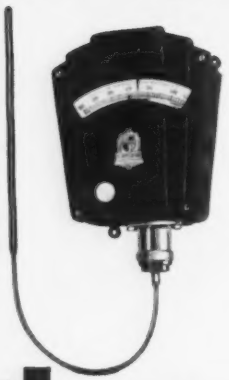

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•Wilson Mechanical Instrument, and Helicoid Gage Divisions of American Chain & Cable Co.

NEW EQUIPMENT

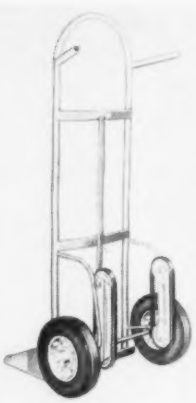
. . . Begins on page 66

Tough hide for industrial purposes

A one-coat application of AMERCOAT No. 87, new vinyl mastic protective coating, is claimed by manufacturer to give more protection against corrosion than previous vinyls, because of its increased vinyl resin content made possible through new combinations of solvents. Non-volatile content, according to company, is over 55%, but coating can be applied with conventional industrial spray equipment. One double-pass spray coat has a thickness of 10 mils and does not flow away from edges and corners. *Amercoat Corp., 4809 Firestone Blvd., South Gate, Calif.*

Trucks that climb

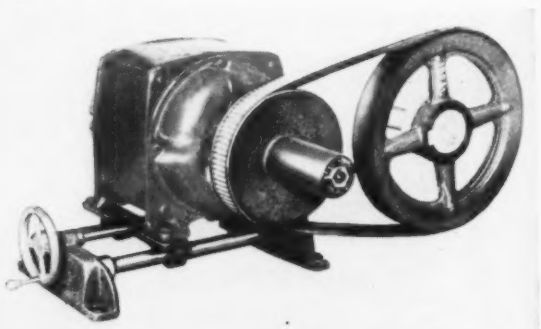
New lines of trucks with rubberized fabric, V-belt stair glides which manufacturer states, cannot damage finished surfaces and are positioned to permit smooth movement parallel to slope of curbs or stairs, rather than conventional raising and lowering of load. Trucks handle cases, crates, cartons, kegs, bags, drums, and barrels. Frame size is 14 x 47 in. high, with choice of 6 or 10 in. rubber-tired wheels. *Nutting Truck and Caster Co., 1201 W. Division St., Faribault, Minn.*



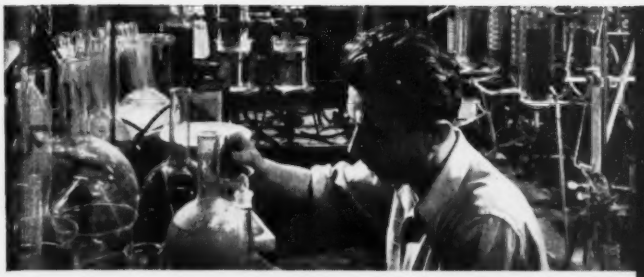
Towmotor LP-Gas fuel system

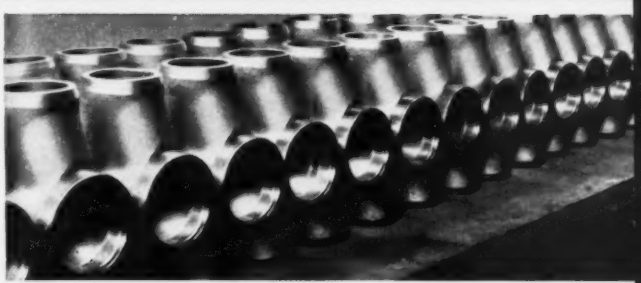
All Towmotor lift trucks are now offered in both gasoline and liquified petroleum gas models. Information on new models, as well as on conversion of present gasoline fuel systems on Towmotor equipment already in use, will be supplied by local Towmotor representatives or *Towmotor Corp., 1226 E. 152nd St., Cleveland 10, Ohio.*

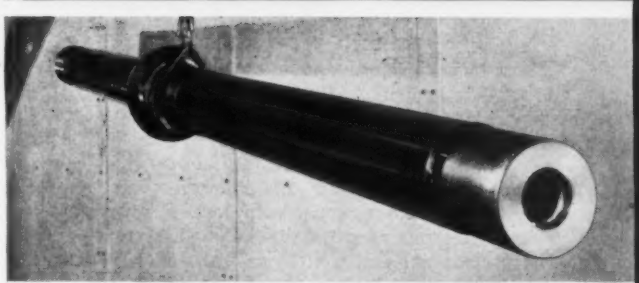
Fingertip control

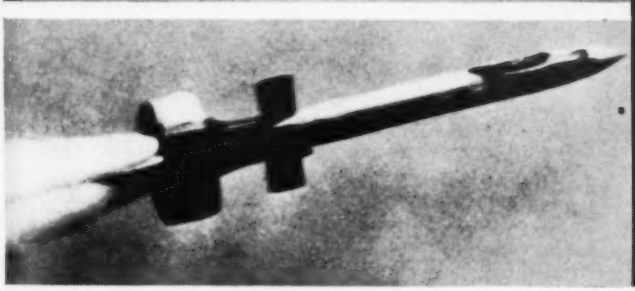


New variable speed pulley, for use on new or old equipment, makes possible quick changes of speed while machinery is in motion. It is recommended where corrections for size or density of parts are required, as well as adjustments for operator ability or temperature and humidity. Ratios provided up to 3 to 1 at from 7½ to 15 hp. *Lovejoy Flexible Coupling Co., 4892 W. Lake St., Chicago 44, Ill.*









"Our research department's big job is improving our own products and processes. This time, we've come up with something other businesses can use, too.

"We've developed a new process—a way to commercially apply a uniform coating of virtually non-porous nickel-phosphorus to many metallic and non-metallic materials—without the use of electricity. General American calls this the KANIGEN* process. Here are some of the things Kanigen can do for you.

"You can coat aluminum directly for hardness, wear resistance, corrosion resistance and solderability. Light aluminum can replace heavy metal—important to electronics manufacturers and aircraft parts suppliers.

"Often, you can coat low-cost metals with a dense, corrosion-resistant material of nickel-phosphorus having a service life comparable with that offered by costly solid or clad materials.

"There is nothing like KANIGEN. Metallurgically unique—not just a substitute for electroplate—it has many unexplored uses. It is available only from General American and our licensees."

a General American engineer discusses the Kanigen process

*"KANIGEN" is a mark identifying chemical deposition of a high-nickel, low-phosphorus alloy by General American Transportation Corporation and its licensees, and the coating resulting therefrom.

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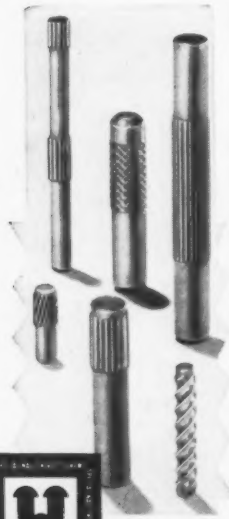

CUT FASTENING COSTS with **HASSALL THREADED PINS**

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We are saving many of our customers from 20% to 50% on their special small threaded pins. These threaded pins may be made to your specifications in a wide variety of metals and finishes. Large or small runs are economical.

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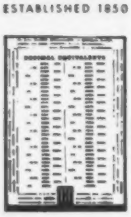

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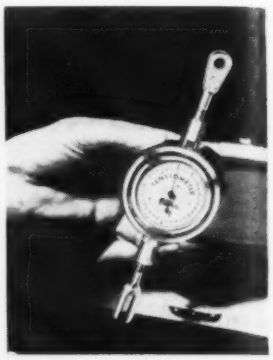
Los Angeles Representative: C. W. Warren Co., 646 N. Fuller Avenue, Los Angeles 36, California

NEW EQUIPMENT

. . . Begins on page 66

Double duty

New turnbuckle proving ring, in addition to reading tensile or compression loads, can be used to apply a tensile load by taking up on the turnbuckle forks at opposite sides. Test set-ups where there is no room for normal loading devices such as air rams, hydraulic pistons, chain hoists, may require this feature. Dial is graduated in angular degrees, and translation of reading into pounds is on a separate calibration reference chart. *W. C. Dillon & Co., Inc., Box 3008, Van Nuys, Calif.*



High-speed plastic molding

New PE-64 is a fully hydraulic preplasticizing type injection molding machine with 64-oz. shot capacity and 425-ton clamping force. Among its features are radial piston type motor driven pumping unit, semi-automatic control, rapid operating speed, adjustable injection speed, independent control of injection and clamping pressures, internally heated plasticizing cylinder with 4-zone temperature control, and plasticizing rate of 200 lb. of polystyrene per hour. *The Watson-Stillman Co., Division of H. K. Porter Co., Inc., 109 Aldene Rd., Roselle, N. J.*

Convertible cutters

New line of Butterfield milling cutters just introduced to this country have this advantage: Staggered tooth side milling cutters have keyways so placed in relation to teeth that any number of cutters with the same number of teeth can be interlocked by grinding hubs to required thickness. Standard stock cutters in this way can be converted into special combination cutters that can cut extra-large slots. Available in Southern California and Arizona through *Garrett Supply Division, 9851 Sepulveda Boulevard, Los Angeles 45*

Hand truck with folding nose extension

New hand truck model can "lower the boom" to handle bulky or unusual loads. In raised position (shown here), unit rests flush against hand truck side members, leaving regular nose unit free to handle conventional loads. Constructed entirely of magnesium, this extension is available for any standard Magliner magnesium hand truck. *Magline, Inc., 1949 Mercer St., Pinconning, Mich.*

Curtain time for this "super-colossal" production is late June. Production: BY CALSTRIP . . . *direction:* by an able team of mill men who know strip from A (annealing furnace) to Z ("Z" mill).

The "story line" of this $650,000 production is simple but dynamic. CALSTRIP will produce strip steel in ultra-close thickness tolerances and in fine finishes to suit your most exacting requirements. But the story reaches its climax when we introduce our new stars . . .

WANT MORE INFORMATION? CALL RAymond 3-1344

The Calstrip Program, with complete information, is yours for the asking. Call or write, without obligation.

You see, Calstrip with this new mill (the only one of its kind in the West) will be capable of producing ★ low-carbon ★ spring and ★ special alloy steels, as well as ★ aluminum strip and other ★ non-ferrous metals. For the first time, Calstrip's incomparable product quality and prompt mill service will be available to manufacturers who require these special strip items in production quantities.

Calstrip STEEL CORPORATION

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● **Rise of the Labor Movement in Los Angeles**

By Grace Heilman Stimson

The first comprehensive study of the labor movement in any large American city. This description of the Los Angeles labor movement, from 1875 to early 1912, traces not only its economic, political, and social evolution but also its relationship to the labor movements of California and the rest of the United States.

548 pages $6.00

● **Employment Expansion and Population Growth**

The California Experience, 1900-1950

By Margaret S. Gordon

A study of the historical trends and fluctuations in the growth of population and employment in California over the past half century. Of interest to all concerned with the economic future of the state and with problems of employment both here and in the nation as a whole.

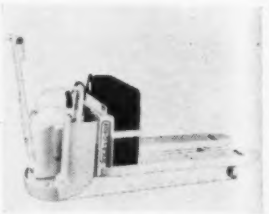
206 pages $3.50

UNIVERSITY OF CALIFORNIA PRESS
Address: Berkeley 4, California

NEW EQUIPMENT

. . . Begins on page 66

Clear it with a Jack Knife

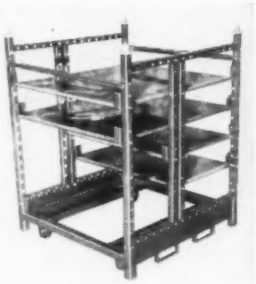


Pallet-type truck is now available in Jack Knife line manufactured by Moto-Truc. Difference in truck clearance angle (shown by solid line in picture) eliminates "hang up" and increases operational range of walkie type trucks, which up to now, manufacturer states, have been limited to level surface or gradual incline operation. Hydraulic pump and ram unit is now optional equipment on complete line of Moto-Truc walkies. *Moto-Truc Co., 1963 E. 59th St., Cleveland 3, Ohio*

Coating galvanized metal

Galvinoleum products are now available, after years of laboratory research and testing, for coating new or old galvanized metal surfaces, without etching treatment. On new galvanized surfaces, it is necessary only to remove grease or oil before coating with Galvinoleum—offered in choice of red, gray, metallic, or green colors. Old galvanized surfaces must be cleaned to remove dirt, grease, and foreign matter. Coating may be either brushed or sprayed. *Rust-Oleum Corp., 2799 Oakton St., Evanston, Ill.*

For close packing and safe stacking



New rack may be erected to suit any multiple of openings, with added feature of different shelf widths on variable vertical placements. This permits packing the rack almost solid, regardless of shape or weight of contents. Steel stirrups and nesting caps provide safety in stacking. Shelves may be masonite, steel, or expanded metal. *Rack Engineering Co., 221 Sixth St., Connellsville, Pa.*

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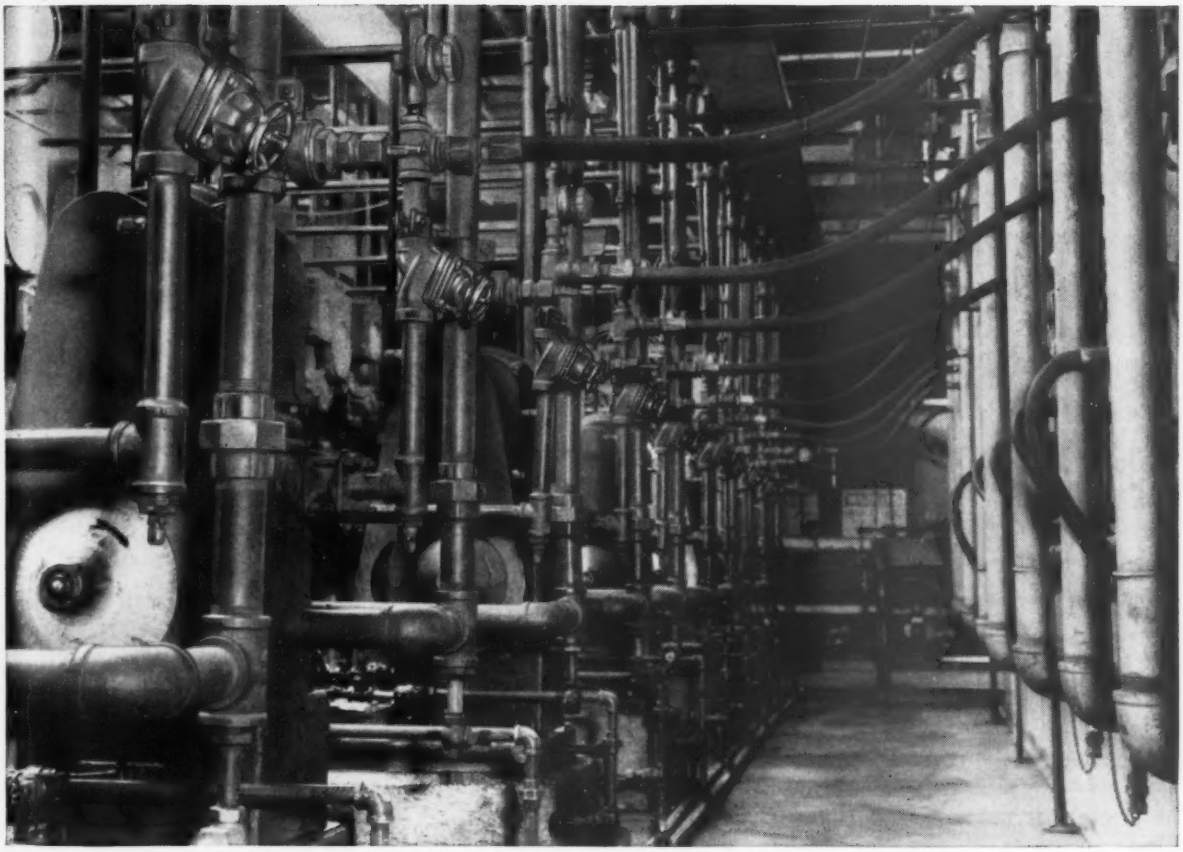
98% OLEUM
and special grades

Garfield ESTABLISHED 1916
700 PACIFIC NAT'L BLDG.
SALT LAKE CITY, UTAH
CHEMICAL & MFG. CORP.



Holding high vacuum with low upkeep is routine for these CRANE VALVES

At the Crosley & Bendix Home Appliance Divs., Avco Mfg. Corp. refrigerator plant at Richmond, Ind., a line vacuum within a few microns of absolute is applied to a dehydration process. But holding this vacuum wasn't always a routine operation.

There was a time when frequent valve failures caused production losses and costly maintenance—stopped only when Crane Packless Diaphragm Valves were installed.

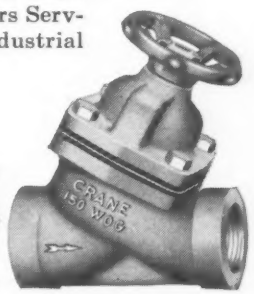
Of the valves formerly used, a multiple metal diaphragm type lasted about 3 months. Crowning of diaphragms caused restriction or closure and made the valves inoperable. Damaged diaphragms meant complete valve replacements.

In other valves, in-leakage at the diaphragm-to-stem connection made them unsatisfactory.

Now in service more than a year, none of the Crane Kel-F Diaphragm Valves has needed any maintenance. Crane simplified construction, giving a longer-life diaphragm... tighter bonnet seal and seating . . . and easier operation . . . is the reason.

The diaphragm in Crane design has longer life because it seals the bonnet only—is not subject to the cutting and crushing encountered when also used for seating. The separate, positive seating disc controls fluid even should diaphragm fail. Wide selection of body materials and trims. Ask your Crane Representative for Circular AD-1942.

Crane Co., General Offices: 836 S. Michigan Ave., Chicago 5, Ill. Branches and Wholesalers Serving All Industrial Areas.



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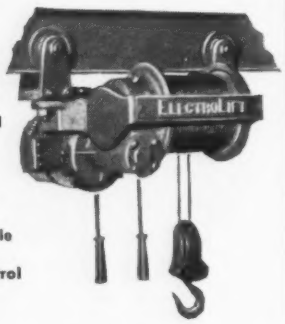

Call the ElectroLift representative listed in your telephone directory.

WORM DRIVE ELECTROLIFT HOISTS

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GLOVE LIFE: ONE WEEK 4 MONTHS

This report of one user is typical of the experience of many who switch to

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Dept. A

THE SURETY RUBBER CO. Carrollton, Ohio

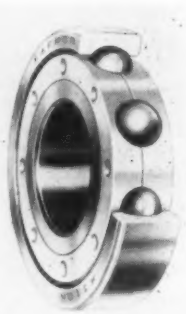
Western Division, 544 Market Street, San Francisco 4, California

NEW EQUIPMENT

. . . Begins on page 66

Ball bearings for heavy duty

M300 series of ball bearings are designed especially for woodworking machinery. They are made with two types of retainers: composition type, light in weight, for high speeds and relatively light loads of machines such as routers, shapers, and moulders; and machined bronze type, to withstand vibration, shock, heavy loads, and speeds found in planers, matchers, edgers, saws. In general, size of bearing determines type of retainer. *Fafnir Bearing Co., New Britain, Conn.*

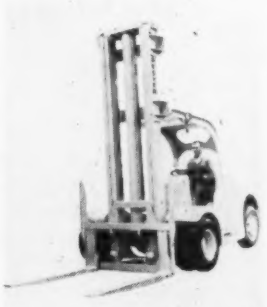


Handling rolls of paper

Rotating clamp for use in industrial trucks provides means of handling both full size and butt paper rolls. Stroke has extra large capacity, capable of handling rolls of paper with diameters from 12 to 51 in., and can pick up loads in either a horizontal or vertical position and rotate them as required. *Elwell-Parker Electric Co., 4205 St. Clair Ave., Cleveland 3, Ohio*

12,000-lb. lift truck

Hyster Co. has added to its lift truck line a new model, RT-120, with capacity of 12,000 lb. New model is similar in design to Hyster RT-150, but has net weight 1,700 lb. less than that model. Some of its features are overhead tilting mechanism, standard lift height of 17 ft. 6 in., maximum speed of over 19 mph. in either forward or reverse, 6-cylinder International Harvester engine. *Hyster Co., 2902 N. E. Clackamas St., Portland 8, Ore.*



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BOOKS FOR INDUSTRY

PLASTICS ENGINEERING handbook

The Society of the Plastics Industry, Inc., has published the second edition of *Plastics Engineering Handbook*, in twenty chapters, prepared by over 200 engineers, technicians, and other authorities in the various branches of the plastics industry. The handbook covers design, materials, processes, equipment, finishing, assembly, testing, and standards of plastics and plastics products and contains 500 illustrations, diagrams, charts, tables, and three special fold-out inserts.

Plastics Engineering Handbook—(Reinhold Publishing Corp., 430 Park Ave., New York, N. Y., $15.00)

CUPOLA OPERATIONS in gray iron foundries

The Cupola and Its Operation is the second edition of a 332-page technical book presenting the combined thinking of authorities on cupola operation. It is the work of the American Foundrymen's Society Cupola Research Committee, which has designed the publication to help gray iron foundries currently operating over 5,000 cupolas in the United States and Canada.

In tonnages, gray iron leads all other cast metals by a 12 to one ratio; therefore this work is a useful contribution to industry.

The Cupola and Its Operation (American Foundrymen's Society, 616 S. Michigan Ave., Chicago, Ill., $9.50. $6.00 to members of AFS.)

DECENTRALIZED MANAGEMENT favored by chief exec's

Reports and findings of a study conducted by the Industrial Relations Section, Princeton University, have been published in a 220-page volume entitled *Centralization and Decentralization in Industrial Relations*. A large percentage of the chief executives whose opinions were sought during the study were found to favor decentralized management. Union officers, however, favoring a wide bargaining area, were highly critical of management's claims of decentralization feasibility.

The detailed study supported the opinion of a large proportion of industrial relations executives that a variable balance between the extremes of centralization and decentralization was both desirable and inevitable. The findings suggest that companies seeking more extensive delegation of responsibility for industrial relation decisions, without violation of the integrity of the organization or the acceptance of too great risks, should be alert to the many factors involved.

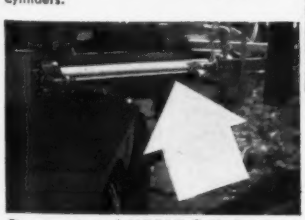
Centralization and Decentralization in Industrial Relations (Princeton University, P. O. Box 248, Princeton, N. J., $4.00)

PUBLICITY CHECKER aids the advertiser

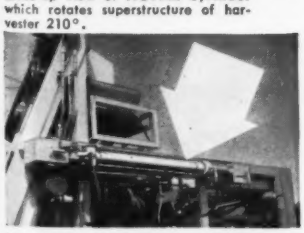
The 1955 edition of Bacon's *Publicity Checker*, a fabricoid, spiral bound book published as an aid in the problems of handling editorial publicity, incorporates a new coding method that types media as to subjects covered. This handy directory lists 3,058 publications and also classifies them into 99 market groups.

Publicity Checker (R. H. Bacon and Co., 343 S. Dearborn St., Chicago, Ill., $15.00)

Arrows show location of 2 NOPAK Cylinders.



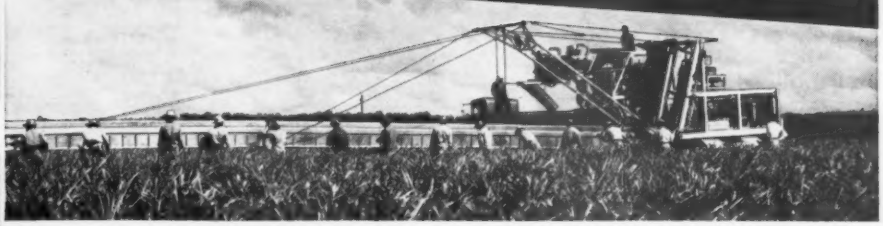
Close-up view of NOPAK Cylinder which rotates superstructure of harvester 210°.



NOPAK 4" x 48" cylinder positions conveyor boom to suit field conditions.

*With the cooperation of NOPAK Hawaiian representative, Chapson Bros. Ltd., Honolulu.

PINEAPPLE HARVESTER
USES 5 NOPAK HYDRAULIC CYLINDERS



Unique Machine Developed in Hawaii by Libby, McNeil & Libby Engineers*

The pineapple harvester pictured is the result of continuing research and experimentation by the mechanical engineering staff of Libby, McNeil and Libby, in striving for better methods, more efficient machines, and lower costs in all operations from field and farm to packing and labeling.

While space does not permit a detailed description of their functions . . . 5 NOPAK Hydraulic Cylinders are used in this self-contained harvester to provide the power for various movements essential to its successful operation.

Power for machine motions . . . pulling, pushing, lifting, feeding, retracting . . . are provided in all kinds of machinery and equipment by NOPAK Cylinders . . . controlled by NOPAK Operating Valves. For a wide range of interesting installations, write for the NOPAK APPLICATION MANUAL.

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WESTERN MACH. CO. Spokane 11, Wash.

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HELPFUL LITERATURE

FOR YOUR CONVENIENCE the company address follows each item.

"Engineered Performance"

. . . explains the advanced process technology used in development of this company's line of electrodes, anodes, mold stock, and graphite specialties. The 2-color, 18-page brochure contains photos and text illustrating the engineering process. *Great Lakes Carbon Corp., 18 E. 48th St., New York 17*

Lubrication chart offered

This 2-color, tough finish wall chart containing lubrication recommendations for many industrial needs is designed to help eliminate lubricant misapplications. Some of the applications covered are hydraulic systems, spindles, air compressors, reduction gears, electric motors, and oven conveyors. *E. F. Houghton and Co., 303 W. Lehigh Ave., Philadelphia 33, Pa.*

Raw materials survey

An evaluation of pig iron produced from local ores by the Northwest Electrodevelopment Laboratory of the Bureau of Mines at Albany, Ore., is the text of Information Circular No. 9, titled "A Lower Columbia Basin Cast Iron Industry Using Scappoose Ores." *Raw Materials Survey, 308 Woodlark Bldg., Portland 5, Ore.*

Hydraulic equipment displayed

Eight-page illustrated catalog (No. SD-B-04) gives specifications and explains operation of Char-Lynn line of hydraulic power units and accessories. Included are Hold-control valves, Strok-control cylinders, light weight full flow filters, compact hydraulic powerpacks for tractors and jeeps. *Char-Lynn Co., 2843 26th Ave. S., Minneapolis 6 Minn.*

Tools and services

A wide variety of machine tools and specialized services available to many different types of industry are listed and described in a fully-illustrated booklet. The book is divided into eight sections: Forging and Heat Treating; Machining; Structural Steel Fabrication and Erection; Plate and Sheet Steel Fabrication; Roll Grinding and Corrugating, Roller Mill Reconditioning; Machinery Installation; Repair and Maintenance Services; and Feed Mill Construction and Alterations. *Moore Dry Dock Co., Oakland, Calif.*

"Packaged" conveyor ends

Bulletin 201, discussing both tension end and drive end component assemblies "packaged" for steel belt conveyors, is offered by Sandvik Steel Inc. Proper applications of each of four tension end assemblies and two drive end assemblies are illustrated. *Sandvik Steel Belt Conveyor Division, Sandvik Steel, Inc., 111 Eighth Ave., New York, N. Y.*

Vital statistics

A 50-page, pocket size booklet summarizes several series of economic data showing the growth and development of Kern County, Calif. The booklet points out the vast industrial expansion that has taken place within the county. *Kern County Board of Trade, P. O. Box 1312, Bakersfield, Calif.*

Four-bolt pillow block

This four-page folder presents Randall's new low-cost four-bolt flange pillow block, with photographs, diagrams, specifications, and recommended lubricants. *Randall Graphite Bearing Inc., S. Greenlawn Ave., Lima, Ohio*

Anniversary issue

The Anniversary issue of Eutectic Welding News (TIS 2463) describes the new and expanded testing and technical information services offered industry following completion of company's new research laboratories. Services offered include scientific analysis of proposed welds, most effective welding procedures for new metals and alloys, data on selection of welding materials to meet specifications. Write *Eutectic Welding Alloys Corp., Flushing 58, N. Y.*

Lifetime gearing manual

A new 32-page, loose-leaf manual (DR No. 2) lists all standard Foote Duti-Rated Lifetime gear sets available by center distance and capacity. Material helpful in the selection of proper gear sets and gear maintenance tips are also included. *Foote Bros. Gear and Machine Corp., 4545 S. Western Blvd., Chicago 9*

Guide aids V-Drive selection

Simplified formulas for standard quarter-turn and V-flat drives are augmented by tables of drives in all belt sections, compiled for quick selection of drives of required ratio and speed, in the new Fort Worth Engineering Guide No. 50-B. Write to *Fort Worth Steel and Machinery Co., P. O. Box 1038, Fort Worth, Texas*

New revolving jib crane

A revolving jib crane designed specifically for storage yard use is described in a 4-page, 2-color bulletin by CraneVeyor Corp. The Roto-Stacker is particularly designed for handling poles and transformers. *CraneVeyor Corp., 1240 S. Boyle Ave., Los Angeles 23*

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M & T now brings you a new arc welding system using Murex CROLOY electrodes for fabricating and repairing chrome-moly steel equipment used in high temperature—high pressure service.

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Murex CROLOY is a chrome-moly weld metal of outstanding stress rupture characteristics and high ductilities over a wide range of temperatures. Further information is available on this new welding system and the unique electrodes that have made it possible. Just write, or have a Murex man call.

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Sales Dept. — Phone Lockhaven 9-5841

HELPFUL LITERATURE

DC motor line described

Information on speed ranges, acceleration rates, enclosures, dimensions, and selection data is included in a 12-page catalog of Reliance Super "T" line of motors. Photographs, diagrams, charts, and sketches help illustrate the design which brought about dynamic response to standard line of motors. *Reliance Electric and Engineering Co., 1088 Ivanhoe Rd., Cleveland 10, Ohio*

New metal-cutting lathe

A new Delta 11-in. metal-cutting lathe and a complete line of engineered accessories are described in an 8-page folder which includes specifications and pertinent information on the new lathe in ten models. *Rockwell Manufacturing Co., 400 N. Lexington Ave., Pittsburgh 8, Pa.*

Extend-a-fork featured

A 4-page bulletin lists the features and specifications of the Yale Warehouser electric truck with new style forks, which extend beyond the outrigger wheels to pick up and deposit loads. Extend-a-fork permits stacking without straddling the load. *Yale and Towne Manufacturing Co., 11000 Roosevelt Blvd., Philadelphia 15, Pa.*

Industrial safety

Four major phases of industrial safety—eye protection, head protection, respiratory protection, and welding safety—make up the major sections of a new 64-page catalog of industrial safety equipment offered by Willson Products, Inc. The catalog is also designed as a workable, everyday safety manual. *Willson Products, Inc., Reading, Pa.*

Miniature motors

Bulletin 254A contains specifications and descriptions of more than 50 miniature motors, fans, and blowers. Offered by *Western Gear, P. O. Box 182, Lynwood, Calif.*

Pump engineering data

A new 40-page, loose-leaf book lists engineering data for the new line of Viking rotary pumps. Section K of the Viking catalog offers information on the design of rotary pumps and charts for simplified selection of the proper pump for any given performance. *Viking Pump Co., Cedar Falls, Ia.*

Vibrating screens

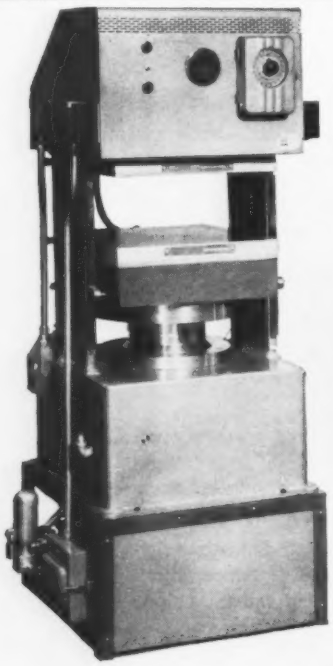
Catalog 2554, describing a new line of vibrating screens for medium and heavy duty screening operations, is offered by Link-Belt Co. Included are capacity charts to aid in selecting a screen for use with a given material at a specific capacity. *Link-Belt Co., 307 N. Michigan Ave., Chicago 1, Ill.*

New method of packing

A new packing system for articles or packages of different shapes and sizes using adjustable fiberboard sections telescoped together to form an outer container, is described and illustrated in a 4-page, 2-color folder. Trade name for the new method and containers is Adjusta-Pak. *Signode Steel Strapping Co., 2600 N. Western Ave., Chicago 47, Ill.*

Place bolts

New illustrated brochure explains design and properties of Place bolts, with spotlight on new slotted-type heads. Included is a guide chart for average Place bolt applications. *Cleveland Cap Screw Co., 2917 E. 79th St., Cleveland 4, Ohio*



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Tool steel selector

A pocket-size tool steel selector, weight calculator, and properties guide for Bethlehem tool steels, made in the form of a durable plastic envelope, with a slide which pulls out to indicate different weights per foot according to different widths and thicknesses, lists eight popular grades of Bethlehem tool steel. These grades fall into the tool and die category and special purpose tool steels. The calculator is available to Western tool steel users. *Bethlehem Pacific Coast Steel Corp., San Francisco*

Financial tools suggested

Practical pointers in corporate finance are offered in "Financial Tools for Western Business," a 12-page booklet. The booklet is based on an article written for WESTERN INDUSTRY by Marco F. Hellman, a senior partner with J. Barth and Co., and explains the role played by the investment banker in Western economics. *J. Barth and Co., 404 Montgomery St., San Francisco 4*

Power Ox increases lift

A new electric lift truck with a 6-inch lift is introduced in Barrett-Cravens Co.'s new Bulletin 551-1. Former 4-in. lift has been increased on this walking type truck, to permit handling skids with a higher range of underclearance. *Barrett-Cravens Co., 628 Dundee Rd., Northbrook, Ill.*

Pump styles described

A new 4-page bulletin (No. 320) describes a new line of rotary hand pumps with detailed discussion of the equipment, its performance features, application data, and other pertinent information. *Blackmer Pump Co., 1809 Century, S. W., Grand Rapids, Mich.*

Die springs listed

Bulletin 72 illustrates the E. W. Bliss Co.'s line of die springs and charts complete specifications data for 500 standard sizes in three distinct pressure groups. *E. W. Bliss Co., Canton, Ohio*

Building materials indexed

A new 20-page booklet indexes Carey Manufacturing Co.'s line of asphalt, asbestos, and magnesia building products. The materials are indexed by product, specification, and product groups. Available from *The Philip Carey Manufacturing Co., Cincinnati 15, Ohio*

Speed reducers described

Dimensions and applications of Falk reducers are illustrated and described in new Bulletin 7107. Included are design diagrams and specifications of single and double reduction units. *The Falk Corp., Milwaukee 8, Wis.*

Self-contained boilers

A 4-page news tabloid, Bulletin AD-144, reviews a new line of boilers, with installations, demonstrations, cut-away views, and plant facilities. Subjects covered include low noise level, operating efficiency, and Boiler Survey. *Cleaver-Brooks Co., Milwaukee 12, Wis.*

Third dimension

A new 2-page bulletin, stressing the use of overhead space in plants for materials handling, lists the features of the Cleveland Tramrail system. Write to *Cleveland Crane and Engineering Co., 1047 E. 289th St., Wickliffe, Ohio.*

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RISK OF PROCESSING ERRORS
UNUSUAL SHAPE PROBLEMS
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HELPFUL LITERATURE

Metal brazing methods

A 24-page manual presents material on the application of the major brazing methods in joining metals using silver alloys and filler metals, fluxes, and gas atmospheres. "Brazing Manual" includes over twenty tables, drawings, and photographic illustrations with discussion on silver brazing procedure, selection of brazing and filler metals, design of brazed joints, prebraze cleaning, assembly of brazed joints, and many other topics. *Air Reduction Pacific Co., 220 Bush St., San Francisco*

Gas vs. electric lift trucks

This new folder contains twelve "Fact Sheets" and two industrial truck maintenance report forms which enable users to keep an accurate breakdown of labor, parts, and power costs for both gasoline and electric trucks. Fact Sheets are a digest of information published by several users and manufacturers of both gasoline and electric trucks. *Lewis-Shepard Products, Inc., Watertown, Mass.*

New fastening technique

Metal stitching, a new method of joining two or more pieces of material with a piece of wire from a spool, is described in a 12-page, 2-color catalog which includes specifications of a new line of equipment. *Acme Steel Products Division 2840 Archer Ave., Chicago 8*

Live rail cuts costs

A 4-page bulletin illustrates how a live rail conveyor installation stopped handling damage and cut costs in RCA-Estate's stamping room. A-F Conveyor's Performance Report No. 102 gives details of the job, the "before" and the "after" in case history form. *The Alvey-Ferguson Co., Azusa, Calif.*

Stud welding

A 4-page, 2-color brochure describes the features of the new Nelson NS-9 stud welder, which is adaptable to welding of studs from 10-gage to 1 in. diameter. *Nelson Stud Welding, Lorain, Ohio*

Hoist line cataloged

Descriptions and specifications of the complete Coffing Hoist line are offered in a new 8-page catalog. Bulletin CL-2 is available from *Coffing Hoist Co., Danville, Ill.*

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PUBLICATIONS FOR SALE

Plumbing uniformity

A uniform code for plumbing, the country's first true national plumbing standard, has 186 pages of plumbing data designed to modernize existing practices and coordinate the work of plumbing equipment manufacturers, architects, contractors, municipal law makers, building officials, and others. It is specifically intended for those municipalities which need it as a basis for setting local standards that are uniform with those used elsewhere in the nation. *American Society of Mechanical Engineers, 29 W. 39th St., New York, N. Y.* ($3.50)

West's chemical producers

An increase of approximately 43% in the number of Western chemical producers in the past six years is indicated in "Directory of Western Chemical Producers," a 100-page book listing specific chemical products and plant locations of prime producers of chemicals in the West. Published by and available from *Stanford Research Institute, Stanford, Calif.* ($5.00)

Catching up

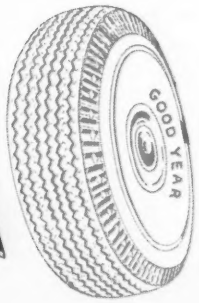
Addenda material has been published by the Tubular Exchanger Manufacturers Assoc. revising their third edition of TEMA Standards, published in 1952. The 1954 addenda material covers all changes and additions that have been approved since publication of the basic manual and is available free to present holders of the third edition, which may be obtained from *Tubular Exchanger Manufacturers Assoc., Inc., 53 Park Place, New York, N. Y.* ($5.50)

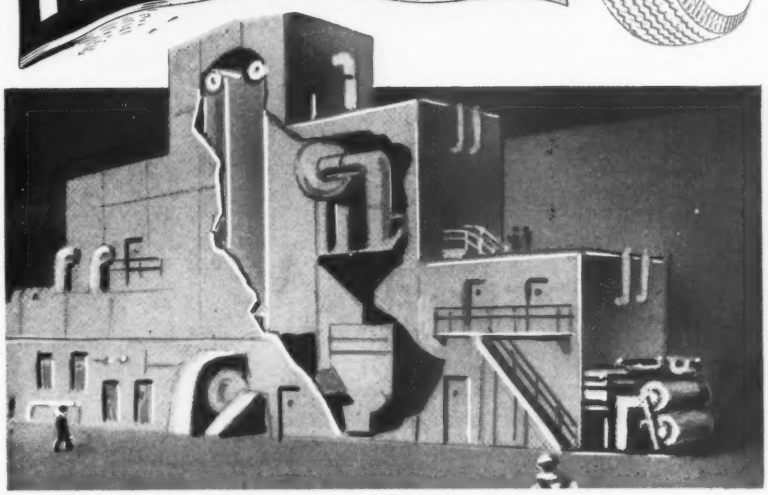
Space for industry

A 40-page publication tabulating, analyzing, and charting data on total site areas, floor areas, proportions of land covered by buildings, worker density, parking ratios, distances from nearest business centers, and other factors reflecting modern practices and operations of 220 modern industrial plants is available from the Urban Land Institute, an independent research organization. Technical Bulletin No. 23 provides needed factual guidance resulting from a study of the actual land requirements and building layouts of plants with a variety of requirements imposed by product. *Urban Land Institute, 1737 K Street, N. W., Washington 6, D. C.* ($5.00)

How TIRE-MAKING HISTORY was made with the aid of

ROSS Drying Equipment





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GOODYEAR 3-T TIRE CORD

The recent development of the triple action tempering process involving Tension, Temperature and Time, presented an entirely new tire cord drying problem. Cooperating with Goodyear engineers, ROSS designed and built this gigantic machine to maintain the 3-T's. It is more than 150 feet in length and stands six stories high. After stretching and dipping with WALDRON mechanical equipment, the cord is zone dried under the tremendous tension required for this history making 3-T process.

It is engineering achievements like this that stamp ROSS as the leader in drying, baking and treating equipment.

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ROSS research and engineering have been responsible for many new developments in products and processes in all major industries:—paper, textiles, plastics, rubber, glass, etc. Write for our new illustrated brochure "P" showing ROSS installations in major industries.

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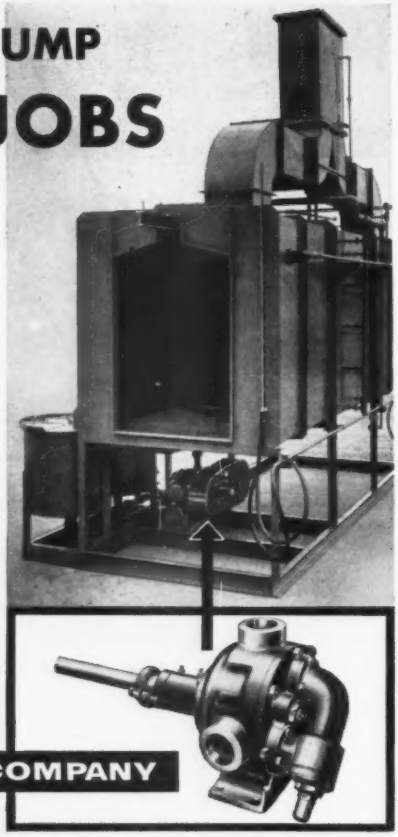
on Erikson Flow Coating Paint Booth



Viking pumps used on the flow coat machines built by Erikson Mfg. Co. of El Monte, California, serve a multi-purpose. Due to the reversing feature of Vikings, a single pump is used to supply paint to the machine and, when reversed, is a fast cleaning pump.

Another outstanding feature of this Viking pump is the variable speed and capacity change. This readily permits regulating rate of flow for painting different size parts.

Whatever your pumping problem for handling thick or thin liquids, ask Viking for the answer. Start today. Ask for folder 55Sa.

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FILMS AND FILMSTRIPS

New concept in metal cutting

Theory, application, and benefits of electrical discharge machining, a new metal working concept using tools softer than the product to cut metals, are offered in a 20-minute film by the Elox Corp. Included is an "underwater" portion showing the Elox process at work in a glass tank filled with liquid coolant. A cutting operation actually requiring 15 minutes has been reduced to 45 seconds for illustration purposes. Contact *Elox Corp., 740 N. Rochester Rd., Clawson, Mich.*

Plastic pipe installations

A 30-minute, 16 mm., sound-color film shows uses and installations of Tenite Butyrate plastic pipe, including a pipeline for the conduction of corrosive water, a reticulation sprinkler system, gas mains and house service lines, and others. *Wilson and Geo. Meyer Co., 333 Montgomery St., San Francisco, Calif.*

World's largest band saw

Development and use of the world's largest contour cutting band saw is presented in the DoAll Co.'s new 16 mm. color film "Production Tooling." This remote control saw solves a problem posed in cutting large dies for one of the largest aluminum extrusion presses in use, which produces structural parts for aircraft under the Air Force "heavy press program." For film loan, write *The DoAll Co., Des Plaines, Ill.*

Airco explains Heliweld

Typical applications of Air Reduction Co.'s tungsten inert-gas arcwelding process, Heliwelding, are shown in "Nothing But the Best," a 20-minute, color-sound movie. Heliwelding was specifically developed for the rapid joining of light gages of the "hard-to-weld" metals and alloys, such as nickel and stainless steel. *Air Reduction Co., 220 Bush St., San Francisco, Calif.*

Motion study simplifies work

A 16 mm. educational film introduces factory foremen, supervisors, and students to the field of motion study and simplification of work through an interesting story situation: a typical foreman coming into contact with motion study for the first time. "The Foreman Discovers Motion

Study" is designed to create an affirmative attitude toward the whole field of motion study rather than to teach principles. *Educational Film Sales, University of California Extension, Los Angeles, Calif.*

Freight and labor costs reduced

Reducing freight rates and labor costs in paper handling at National Container Corp. through the use of a chisel plate for lift truck attachment, which transports rolls of paper from boxcars to a storage area, is the theme of a new 8-minute film produced by the Clark Equipment Co. This film shows how use of the chisel plate to store kraft rolls on end instead of on the side increased boxcar loads from 21 to 40 tons and reduced a three-man operation to a one-man task. Write to *Clark Equipment Co., Battle Creek, Mich.*

Side-squeezing loads

Increased storage capacity and reduced costs in unloading, stacking, and loading-out of wooden lugs with the new Hyster "box grab" is the theme of a new 16 mm. sound film offered by Hyster Co. Portland, Ore. The new attachment eliminates need for pallets by side-squeezing loads. *Hyster Co., 2902 N.E. Clackamas St., Portland, Ore.*

Award-winning safety film

How the careless or the self-assured woodworking employee endangers not only his own life, but those of fellow workers, is illustrated in a newly produced safety film which received a recent award of merit from the National Committee on Films for Safety. This 13-minute, 16 mm. film is for sale from the *International Film Bureau Inc., 57 E. Jackson Blvd., Chicago 4, Ill.*

Peelable plastic packaging

Application of butyrate peelable plastic for packaging of such products as gears, pistons, crankshafts, and other precision parts, and tools, gages, and measuring instruments is demonstrated in a new 15-minute, 16 mm. sound movie by Eastman Chemical Products, Inc. Highlights are preparation, design of melt tanks, and the dipping procedure. Write to *Eastman Chemical Products, Inc., 260 Madison Ave., New York 16.*

Die casting improves design

A sound-color 16 mm. film shows how, through extensive use of the die casting process, production design can be improved and costs reduced. "Die Casting—How Else Would You Make It?" which runs 35 minutes, includes an evaluation of zinc, aluminum, magnesium, and copper base die casting alloys. *American Zinc Institute, Inc., 60 East 42nd St., New York.*

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This mighty diesel tractor preforms double duty in road construction—powering huge scrapers or compactors—to prepare the way for miles of modern highways across the nation.

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THE *Lufkin* LINE

OVER THE HILL . . .
FROM DEATH VALLEY

V. J. Fawcett

It says in the book that no tourist, in his right mind, should attempt to cross Death Valley earlier than October or later than April. This waterless waste-land swelters in summer temperatures to 120°, and in winter, the mercury often drops to 30° below zero, near the mountain tops.

It doesn't give any summer warnings about reaching Trona, or the Searles Valley, or Searles Lake, but just like tourists, salesmen pay no attention to such warnings anyway. For descriptive purposes, let's say this region lies across the Panamint Mountains from Death Valley, and is about one-hundred miles southwest of Badwater, the lowest point in the Western hemisphere.

Fortunately, for us, it is not necessary to cross Death Valley in the summertime to reach Trona, 170 miles northeast of Los Angeles. Neither is Trona one of California's cooler summer communities. Trona is the home of American Potash and Chemical Corporation, a fabulous desert enterprise. For every day in the year, some 2,000 tons of chemicals are extracted from the briny solution far below the surface of Searles Lake.

Plant improvement and modernization is going on constantly at Trona. Currently the Stearns-Roger folks of Denver are busily engaged in the erection of new plant facilities including a Cooling Tower built by Santa Fe Tank and Company, Los Angeles. Gear fan-drives are by Lufkin.

P.S. If you like legend, why not stop over at Scotty's Castle on a visit to Death Valley. Guaranteed: no Lufkin gear peddlers on duty.

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WESTERNERS AT WORK

CALIFORNIA

Air Pollution Foundation

Dr. William L. Faith is elected vice president and chief engineer of this independent research organization located at Los Angeles. He has been associated with the Foundation, as deputy director and chief engineer, since its formation last year.

American Smelting and Refining Co.

Leo Halpern resigns his post as Pacific Coast manager of this company's Federated Metals Division. His successor is *Frederick Farnow*, at present manager of division's San Francisco plant.

Union Carbide and Carbon Corp.

Isaac M. Stewart, vice president since 1949 of this firm, which has its main offices in New York, is named resident vice president at San Francisco.

Automatic Records Corp.

William H. Beretish is named vice president in charge of manufacturing and subcontracting by this Los Angeles firm.

Shell Oil Co.

Joseph M. Wilson is named assistant superintendent at company's Wilmington-Dominguez refineries, and *George W. Foster* becomes personnel and industrial relations manager. Mr. Wilson succeeds *G. A. Lorenz*, now superintendent of Montreal refinery of Shell Oil Co. of Canada, Ltd. Mr. Foster replaces *A. D. Northcutt*, now manager of personnel and industrial relations at Anacortes, Wash., refinery.

Wilshire Oil Co.

John Ouding is promoted to manager of manufacturing from his former post of refinery superintendent, which he has held since 1952. *Roy Waer* is promoted to manager of crude oil supply and exchange department.

Shell Chemical Corp.

M. Voogd, former manager of government butadiene plant at Torrance built and operated by Shell Chemical, is named manager of combined butadiene-styrene-copolymer facilities under Shell ownership. Superintendent of new combined operation is *G. S. Williamson*, who formerly served in that capacity at butadiene plant. *E. S. Martin*, former senior technologist at head office, is named assistant superintendent. *D. A. Limerick*, former manager of operations department at plant, becomes assistant superintendent. *J. Levada*, former chief engineer at plant, is appointed chief engineer, and *M. L. Sagenkahn*, former chief technologist at Martinez, Calif., is named chief technologist of new operation. *A. H. Anderegg*, former assistant chief chemist at Houston, Tex., will serve as chief chemist.

Swift and Co.

F. S. Sigler is named superintendent of this company's South San Francisco plant, succeeding *Howard S. Thorne*, retired.

Longview Fibre Co.

Dan B. Phillips is new plant manager for this company at Oakland. *Omar Denny*, who formerly held that post, has retired.

Ampex Corp.

G. I. Long is elected president of this Redwood City manufacturer of recording equipment. He succeeds *Alexander M. Poniatoff*, who is named founder and chairman of the board.

John V. Zuckerman joins company as manager of personnel and plant services. For past five years he has been conducting audio-visual and personnel management programs for Air Force and Army. In his new post he will be assisted by *Robert I. Cooper*, who supervises personnel relations; *A. J. Wilson, Jr.*, plant engineer, and *Harold E. Kren*, head of office services.

Robert Pappas is new quality control manager. He leaves post of quality control manager at Schaible Co. of Cincinnati, Ohio.

J. V. Zuckerman
Ampex Corp.

J. W. Miller
Kaiser Steel Corp.

Kaiser Steel Corp.

John W. Miller is named manager of product planning for this Oakland company. He moves up from post of superintendent, production planning, at Kaiser's Fontana mill, where he has served in several capacities since 1944.

Consolidated Engineering Corp.

This Pasadena manufacturer advances following five men in its engineering division: *John Kinkel*, *Herbert Chambers*, and *Theodore Miller*, each appointed supervisor of a product development group, and *Howard Lyon* and *Charles Blanchard*, each to head a product engineering group.

Executive Research, Inc.

James F. Bone, who was formerly manager of industrial department of Los Angeles Chamber of Commerce, joins staff of this Los Angeles and New York public relations and management consulting firm.

General Electric Co.

Clarence C. Walker is elected commercial vice president of company's Western region covering eight Western states, with offices in San Francisco. He moves from position of vice president and general manager of construction materials division, Bridgeport, Conn., to succeed *Ray W. Turnbull*, who will retire on June 30 after 43 years with company.

American Potash and Chemical Corp.

George T. Deck, former technical director at company's main plant, Trona, is named plant manager of newly-formed American Lithium Chemicals, Inc., near San Antonio, Tex., of which American Potash is part owner.

Southern Pacific Co.

R. C. Nissen is appointed assistant chief engineer for this railroad, succeeding *W. M. Jaekle*, now in post of chief engineer. His former post as assistant to chief engineer is now filled by *J. A. Holmes*, who has been construction engineer at San Francisco. *D. K. McNear* succeeds Mr. Holmes, moving up from post of assistant division engineer.

Pacific Intermountain Express

Paul W. James joins this Oakland trucker as assistant director of employee relations. He has previously been working in industrial relations field for California Trucking Associations, Fortier Transportation Co., and Bigge Drayage Co.

National Welding Equipment Co.

Ernest L. Mathy is appointed vice president and general manager of this San Francisco company. He has been active in welding industry for over thirty years.

E. L. Mathy
National Welding Equipment Co.

H. C. Zintz
Rucker Co.

Rucker Co.

Howard C. Zintz is named chief engineer of this Oakland manufacturer of fluid-power equipment. He was formerly hydraulic engineer with Corning Glass Works, Corning, N.Y.

Marquardt Aircraft Co.

A. M. Davis, former chief production engineer of A. V. Roe Canada, Ltd., joins power plant division of this Van Nuys aircraft company, where he will serve as chief of engineering and manufacturing services.

Roylyn, Inc.

Dave Lasher, who joined this Glendale company in 1952 as assistant to works manager, is named manager of production services, covering material control, purchasing, outside production, and estimating. *Renato Pene* becomes production superintendent, moving up from job of shop foreman.

Standard Oil Co. of Calif.

G. B. Hargens, assistant to vice president, heads company's newly established marketing research division.

Stillman Rubber Co.

Philip B. Keller is appointed vice president in charge of engineering for this Culver City manufacturer of molded rubber products. Prior to joining company, he was in charge of new product development at R. T. Collier Corp., Los Angeles, and earlier with North American Aviation.

American Pipe and Construction Co.

W. Allen Grubb, former manager of Northwest division of this company at Portland, is transferred to Southern California division, South Gate, in same position.

Tide Water Associated Oil Co.

Howard G. Fillhower is appointed manager of employee relations department of this company, with headquarters in San Francisco. He will be assisted by *Claude E. Fountain*, who was formerly assistant to manager of Western division employee relations department. *Harold J. Maddock* advances to post of chief technologist of Avon Flying A refinery at Associated. He has been with company since 1943, and last held post of assistant chief technologist. *James F. Dehnert* succeeds him. Mr. Dehnert started as a junior chemist in 1945 in refinery's control laboratory.

Packard-Bell Co.

Maj. Gen. Edmund C. Langmead (Ret.) is named assistant director of technical products division for this Los Angeles manufacturer of television sets and electronic equipment.

Irving Subway Grating Co., Inc.

James E. Irving becomes president of Western division of this Oakland company, which manufactures industrial grating. He replaces *J. C. Lynn*, deceased.

Moffett Engineering Co.

Glen Coulson succeeds *Robert Blau* as chief engineer of this Albany company. Mr. Blau has resigned to join McDonald Engineering Co., Chicago.

Libby, McNeill and Libby

W. O. Ross transfers to company's Sunnyvale operation. He is succeeded in the post of superintendent at Sacramento plant, which he has held since 1936, by *James R. Stoner*, former assistant plant superintendent.

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This ingeniously designed extension hoist lifts materials up as high as 80 ft. in one minute, according to the builder, Campbell Equipment Co., Chicago, Ill. Provides easy, one man, one hand control and delivers all kinds of loose and bulk materials directly to the working area for automatic dumping or removal by workmen. Designed for use on construction or storage jobs, it eliminates dangerous swinging buckets and risky reaching operations. Can be used with platform, wheelbarrow or scoop, carrying up to 1,000 lbs. per load.

This is another typical assignment for the dependable foolproof Lugging Power of Wisconsin Heavy-Duty AIR-COOLED Engines . . . power that Fits the Job and the Equipment, delivering maximum on-the-job service with minimum servicing. You can't do better than to specify "Wisconsin Engine Power" for the equipment you design and build.

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WESTERNERS AT WORK

Northrop Aircraft, Inc.
Ray Gayner, former assistant chief engineer, is named assistant to vice president in charge of manufacturing, and is succeeded in his last post by *George Douglas*.

Fibreboard Products, Inc.
R. J. Contel is appointed department manager of frozen food packaging for this San Francisco manufacturer.

COLORADO

C. A. Norgren Co.
William O. Hall is appointed chief field engineer of this Englewood company. He has been with Norgren for past five years, three of them as chief project and test engineer.

Colorado Oil and Gas Corp.
Richard I. Galland is elected to position of vice president and general counsel of this Denver company, moving from chief counsel position with Olin-Mathieson Chemical Corp.

IDAHO

Idaho Natural Gas Co.
George W. Carpenter is elected president of this firm. He moves to the firm's Boise headquarters from New York.

Bunker Hill and Sullivan Mining and Concentrating Co.
John D. Bradley, vice president of Bradley Mining Co. of San Francisco, is named president of this Kellogg mining enterprise. He has served as executive vice president of Bunker Hill for past year. Former president, *J. P. Haffner* of Spokane, retires.

MONTANA

Anaconda Copper Mining Co.
W. A. Emanuel, superintendent of zinc plant since 1938, becomes general superintendent, succeeding *E. A. Barnard*, retired. New superintendent of smelter is *J. H. McCrea*, former assistant superintendent. He replaces *H. J. Maguire*, retired. *J. R. Moore*, whose last post was superintendent of ferromanganese plant, is promoted to newly created post of superintendent of ore crushing and conveyor plant. *C. M. Holstrom* succeeds Mr. Emanuel as superintendent of zinc plant. *E. S. Kramlich* is promoted to superintendent of ferromanganese plant.

NEVADA

Consolidated Coppermines Corp.
Harry M. Brindle is promoted to chief engineer of this Ely firm. He was formerly assistant chief engineer and is succeeded by *Woodward J. Latava*. *Harold W. Bishop*, former chief engineer, resigns.

OREGON

Gresham Berry Growers
New general manager of this Gresham packing company is *William J. Linfoot*, formerly manager of Producers Co-op Packing Co., Salem.

Forest Fibre Products Co.

Jack Mulholland
Forest Fibre
Products Co.

Jack Mulholland is appointed to newly created position of quality control supervisor for this Forest Grove company.

Iron Fireman Manufacturing Co.
Norman W. Stunkard, former assistant chief engineer of Iron Fireman Manufacturing Co.'s electronics division in Portland, is named manager of the Iron Fireman Swenson Thermal Research, Inc., plant in Cleveland, Ohio.

Producers Co-op Packing Co.
Alvin H. Randall, general manager at United Growers, Inc., Salem, will also manage this packing plant at Salem.

New Parker Hoze-lok fittings make up easier, are re-usable

- Longer, trouble-free service. Because of unusually large gripping area, *Hoze-lok* won't pull out.
- Socket thread is larger than braid diameter, making it easier to insert hose end into socket. Socket contour provides greater wrench clearance at hex of nipple.
- Greater re-usability. You don't need big inventories.
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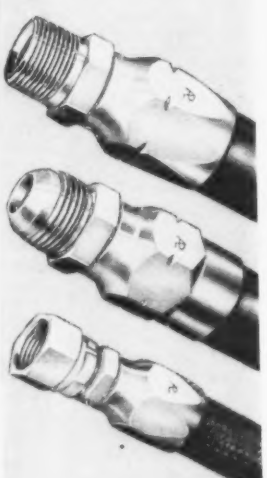

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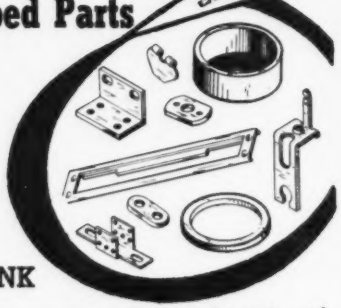

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STAMPINGS in SMALL LOTS

UTAH

Bureau of Economic and Business Research University of Utah

L. Victor Riches resigns his post as head of this research bureau of the University to join staff of Stanford Research Institute at Stanford, Calif.

United States Steel Corp.

H. M. Thomas
Consolidated Western Steel Division

H. M. Thomas is promoted from assistant superintendent of the Geneva works to general superintendent of new pipe mill for Consolidated Western near Provo, replacing *W. E. Fogerson* who has been transferred to another of the company's projects.

Kennecott Copper Corp.

O'Dell C. Madsen, of Bountiful, former administrative accountant, is appointed assistant division comptroller of the company's Utah Copper Division.

Byron E. Grant, former private consultant in Salt Lake City, joins the Braden Copper Co., Kennecott's Chilean division, as assistant general manager, and will take up residence in Chile.

WASHINGTON

General Electric Co.

Charles N. Gross is promoted to acting manager of the Richland communications and public relations section. He replaces *George L. Brown*, who moves to the company's Kentucky unit.

Lindsay Soft Water Co.

Chet I. Fouche is named general manager of this Spokane firm. He moves from another Spokane firm.

Pacific Car and Foundry Co.

Floyd V. Snodgrass, former assistant to vice president of this Renton firm, resigns to join Walworth Co. of New York, where he has been elected vice president in charge of production.

Yakima Fruit Growers

Wayne Clark, manager of the Benton City plant, is transferred to Grandview. *Harold Warner*, Grandview plant manager, moves to Kennewick operations.

Reynolds Metals Co.

Vernon G. Kneeskern becomes manager of aluminum reduction plant at Longview, succeeding *H. W. Shoemaker*, who now heads Troutdale, Ore., reduction plant.

WYOMING

Mountain States Telephone and Telegraph Co.

Ewald H. Rempel is named Wyoming chief engineer. He will headquarter in Cheyenne.

ASSOCIATIONS ELECT

American Society of Tool Engineers:

Fourth vice president, *Wayne Ewing*, president, Arrowsmith Tool and Die Co., Inc., Los Angeles.

American Institute of Mining, Metallurgical and Petroleum Engineers:

Vice president, *William Wallace Mein, Jr.*, president of Calaveras Cement Co. and Bishop Oil Co., San Francisco.

Plant Engineers Society of Los Angeles:

President, *T. H. Hardgrove*, Aerojet-General Corp.; vice president, *J. S. Hutchinson*, Exchange Lemon Products Co.; secretary, *H. M. Eversz*, McCulloch Motors Corp.; treasurer, *R. E. Wills*, Pabst Brewing Co.

West Coast Wood-Preserving Operators' Assoc.:

President, *Ralph F. Dreitzler*, general manager of West Coast Wood-Preserving Co., Seattle; vice president, *James McGregor*, McCormick and Baxter Creosoting Co., Portland; treasurer, *V. C. Monahan*, Cascade Pole Co., Tacoma; secretary, *R. F. Gillespie*, J. H. Baxter Co., Eugene.

Small Defense Industries Assoc.:

President, *Hampden Wentworth*, Longren Aircraft Co.; vice presidents, *Gen. W. W. Kratz*, Electronic Products Co., and *Roy E. Klotz*, Anadite, Inc.; vice president and treasurer, *Leo A. Pfankuch*, Sturgess, Inc.; secretary, *William L. Worthen*, Bone Engineering Co.

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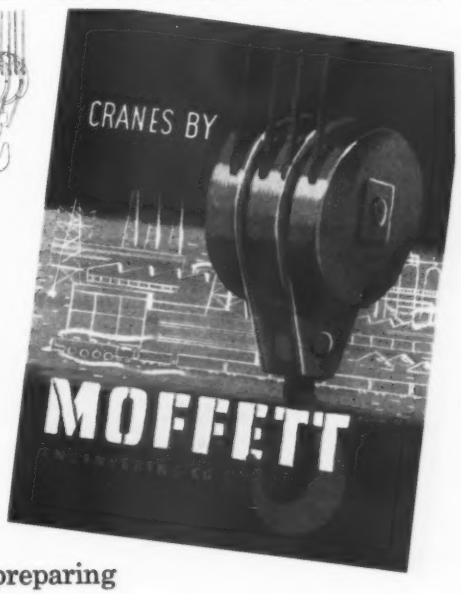

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2nd Annual Plant & Maintenance Issue of

Western Industry

Articles on maintenance of buildings, grounds, equipment, plant services and plant utilities—concentrating on the special problems of Western plant managers and operating and maintenance executives.

Out June 15

Advertising Forms Close May 20

TRADE WINDS

Hall-Scott appointments

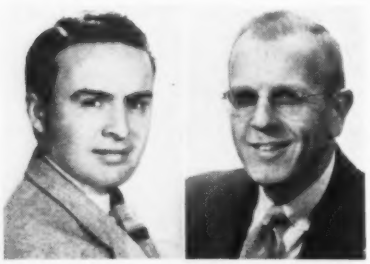
A. G. Baxter is new sales manager of the Hall-Scott Motors Co., Berkeley, Calif. D. J. Treadway is appointed service manager. Both are veteran employes of company—Mr. Baxter for 26 years, and Mr. Treadway for 19 years.

Representative Weston

M and M Wood Working Co., Portland, Ore., appoints Robert J. Weston of Los Angeles as sales representative in California, Arizona, and New Mexico area. He was former Southern California field representative for Douglas Fir Plywood Assoc.

Manager, industrial controls

Sumner Ladd is new manager of industrial controls division of General Controls Co., Glendale, Calif., manufacturer of automatic controls for residential, industrial, and military use. Up to now he has been a factory sales engineer acting in a liaison capacity between engineering and sales divisions. In his new position, he will advise country-wide sales forces for company's industrial product line.

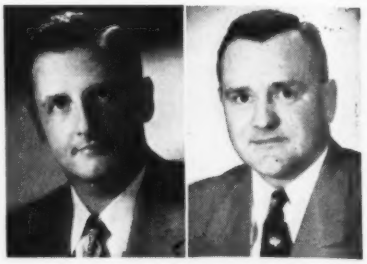


Sumner Ladd, General Controls Co. *D. F. Anderson, Deming Co.*

New Deming representative

Dexter F. Anderson is new Western representative for the Deming Co., Salem, Ohio, manufacturers of pumps and water systems. He will cover ten states west of the Rocky mountains.

Bethlehem Pacific changes



J. A. Crooks *C. D. Howe*
Bethlehem Pacific Coast Steel Corp.

J. A. Crooks, former assistant to vice president, sales, is new assistant general manager of sales for Bethlehem Pacific Coast Steel Corp., with San Francisco headquarters. C. D. Howe is appointed manager of sales for company's San Francisco district. He has been manager of company's bolt and nut sales since 1952, and in his new post succeeds the late F. J. Anderson.

New dealer for Foote Bros.

Edward D. Maltby Co., Inc., of Los Angeles, is new stocking distributor for Foote Bros. Gear and Machine Corp., Chicago. The company will distribute Foote power transmission products in Southern California area.

New Western outlet

Bearing Engineering and Supply Co., of Seattle is new stocking distributor for Randall Graphite Bearings, Inc., Lima, Ohio. Territory covered includes Washington and Alaska.

Aeroquip hose distributor

Aero-Coupling Corp. appoints Los Angeles Rubber and Asbestos Co. as distributor of Aeorquip hose lines and couplings in the Southern California area.

Pump ABRASIVES, ACIDS, CORROSIVES, with John BEAN INDUSTRIAL PUMPS

WRITE for applications catalog.

John Bean Pumps are designed to handle gritty and corrosive materials, creosote, paint remover, drilling mud, bordeaux mixtures, varnish, paint and silicone resins. High-pressure does it! Diamond-tough Sapphite cylinders resist wear and stay glass-smooth!

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FOOD MACHINERY and CHEMICAL CORPORATION JOHN BEAN DIVISION
Dept. WI, P. O. Box 145, San Jose 1, Calif.

CF reorganization

Consolidated Freightways, Inc., Portland, reorganizes sales departments and changes assignments as follows. New post of vice president for sales is filled by Ray Doherty, Jr., formerly in charge of administration and personnel, a post that will now be filled by Harold Gray, who last held post of superintendent of northwestern division.

W. J. Grant, former director of advertising and publications, steps up to head an enlarged sales promotion and advertising department.

Spotlight on new equipment

Harnischfeger Corp.'s Western division, headquarters in Oakland, displays new equipment in crane, engine, shovel, hoist, and welder lines at customer party April 22. Western division accounted for 26% of company's entire business in 1954.

LP-gas service

American Liquid Gas Corp. opens new Los Angeles service and installation department providing complete facilities for service and installation of new LP-Gas carburetion systems in lift trucks, passenger cars, buses, taxicabs and other vehicles.

New Colloidair outlet

Nicholas A. D'Arcy, Jr., Huntington Park, Calif., is new representative for Bulkley, Dunton Processes Inc., of New York, for Southern California area, handling the firm's Colloidair Separator water clarification equipment.

Western sales specialist

H. T. Anderson is new Pacific Coast sales engineer in the territory of California, Oregon, Washington, Idaho, Nevada, Utah, and Arizona for the heavy machinery division of Nordberg Manufacturing Co., Milwaukee, Wis. He is former manager of the company's New York office.

Reliance names two

Keith Chase *L. H. Stringfellow*
Reliance Steel Co.

L. H. Stringfellow is named vice president of Reliance Steel Co., Los Angeles warehouse distributors of steel, aluminum, and magnesium. He will be in charge of customer relations. Keith Chase is new Reliance sales manager.

New lube distributor

O. L. King and Co., San Francisco, is new distributor for Scientific Lubricant Co., Chicago, and will handle sales of the company's products in the Bay Area.

Moving West

Westinghouse Electric Corp. names C. Spence Purnell manager of the company's South Pacific district including Southern California, Arizona, and Las Vegas, Nev., with headquarters in Los Angeles. He was formerly sales executive in the New York headquarters. Stanley M. Johns, who was district manager in Los Angeles from 1949 to the present, moves to Muncie, Ind., as manager of hydraulic drives department of Westinghouse gearing division there.

Joins sales force

Harry R. Butler joins sales force of The Hoist and Conveyor Co., Huntington Park, Calif. He will handle all capacity cranes, monorails, electric hoists, chain conveyors, and hand hoists and trolleys. Mr. Butler has previously been associated with Yale & Towne, Shepard Niles Crane and Hoist, Richards-Wilcox, and Philadelphia Chain Block.

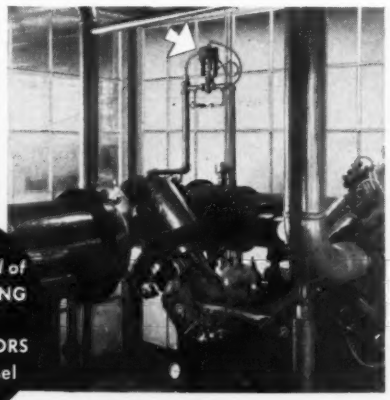
Harshaw appoints

Donald L. Raworth is new Northern California sales and service representative for Harshaw Scientific Corp. and will have his headquarters in Oakland. He joined the sales staff of this Cleveland manufacturer shortly after World War II.

FMC exclusive

Canning Machinery Division of Food Machinery and Chemical Corp., San Jose, becomes exclusive sales agents for the "Sure-Way" package caser, an automatic package loader.

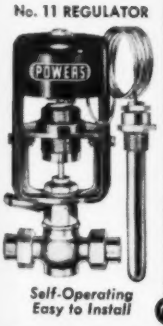
TEMPERATURE of cooling water system for 2-stage air compressor at CECO STEEL CORP. is controlled by 2 Powers Regulators



For Reliable Control of JACKET COOLING WATER In AIR COMPRESSORS Gas and Diesel Engines

Use POWERS REGULATORS

No. 11 REGULATOR



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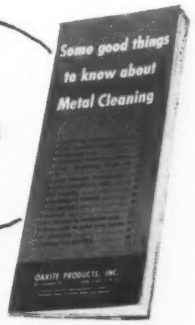
Over 60 Years of Automatic Temperature and Humidity Control

WHICH JOB WOULD YOU LIKE TO IMPROVE?



Listed below are some of the jobs discussed in Oakite's 44-page illustrated booklet on Metal Cleaning. Let us help you do them with better results, greater economy.

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Tell me about Oakite methods for the following jobs:

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- ☐ Rust prevention
- ☐ ALSO send me a FREE copy of your booklet *"Some good things to know about Metal Cleaning"*

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SPECIALIZED INDUSTRIAL CLEANING
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MATERIALS • METHODS • SERVICE

TRADE WINDS

Furnace sales

Heat and Control, Inc., with headquarters in San Francisco, is new West Coast representative for the Gas Machinery Company, Cleveland, Ohio, and will handle the firm's industrial furnace line.

New rubber distributors

Hewitt-Robbins, Inc., Los Angeles, appoints Washington Belting and Rubber Co. as stocking distributors of its complete line of industrial rubber products, idlers, vibrating, and conveying equipment. The new distributors, whose principals are A. L. Lanhan and Hugh C. Wallace, maintain three branches: Tacoma, Seattle, and Everett, Wash.

Report on Bridgeport

Bridgeport Brass Co. has a new warehouse for brass and copper mill products at 6500 E. Flotilla St., Los Angeles. Herman W. Steinkraus, president, officially opened it at a reception on March 31. Also present were John A. Dawson, vice president, Leslie S. Menns, Pacific Coast sales manager, and Richard V. Lusk, Los Angeles district manager. New warehouse has a 50% larger area than Bridgeport's previous warehouse. Los Angeles district sales office is also at this address.

Kushman adds new line

Geo. A. Kushman Co. of Oakland, Calif., is new Western representative for Char-Lynn Co. of Minneapolis, Minn., manufacturers of industrial hydraulic power equipment. The Kushman Co. is in the process of appointing distributors in its new territory.

Pennsalt appoints

Pacific Wood Tank Corp., San Francisco, is new representative for Pennsylvania Salt Manufacturing Co., of Tacoma, Washington, for tank coating line.

McComas to Arcadia

Arcadia Metal Products, Arcadia, Calif., manufacturer of sliding glass doors, appoints Owen L. McComas to newly created post of director of merchandising. He formerly served with Southern California Gas Co. in sales and promotion positions.

O. L. McComas
Arcadia Metal Products

C. E. Frost
Joseph T. Ryerson and Son, Inc.

Ryerson moves man west

Charles E. Frost is new sales representative of the alloy steel department at the Los Angeles plant of Joseph T. Ryerson and Son, Inc. He served with the company's Chicago operation formerly.

Rapistan picks Schobinger

Gene Schobinger, general manager of Rapids-Standard of California, Inc., San Francisco, is new Rapistan West Coast regional manager. He will be responsible for coordination of West Coast sales and training programs in Washington, Oregon, and California.

Customer relations head

James I. Stultz heads a new customer relations department at Ampex Corp., Redwood City, Calif., manufacturers of magnetic tape recorders. He was formerly manager of company's field service engineering department.

New line for Bushnell

Bushnell Controls and Equipment Co., Inc., of Oakland is new sales representative for Hapman-Dutton Co., of Kalamazoo, Mich., and will handle Dutton's line of packaged steam boilers.

Coming and going

Fibreboard Products Inc. appoints R. J. Contel, formerly eastern sales representative, to newly created position of department manager of frozen food packaging, with headquarters in San Francisco. W. E. Berg moves from San Francisco sales staff to replace Mr. Contel in New York.

BRAZING

COPPER BRAZING – of steel assemblies with controlled atmosphere electric furnaces.

SILVER BRAZING – of all metals by Hi-frequency induction heating or furnace.

BRIGHT ANNEALING – of all metals with conveyor belt electric furnace.

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FABRIFORM METAL PRODUCTS Div. of GEORGE GETZ Corp.

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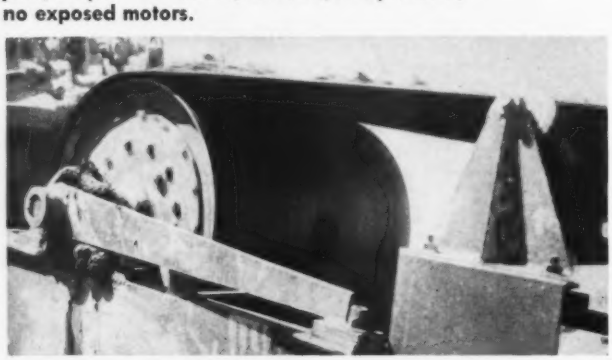
"The Head Pulley with Motor Inside." Safe, compact, simple—no chains, no belts, no sprockets, no exposed motors.



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All moving parts fit compactly inside pulley shell, protected against weather and dirt, thus practically eliminating pulley troubles. This pulley with motor inside requires no more room than an idler pulley; can be installed quickly. Diameters 10½" to 56". ⅓ to 125 hp. for voltages to 2300. Job proved. Write TODAY for folder and name of nearest distributor.

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Office at Plant on South Jefferson Rd. Brokers Protected Phone Tracy 284

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Send ad to Classified Dept.,
WESTERN INDUSTRY, 609 Mission St., San Francisco 5, Calif.

We make them all

Big bolts, small bolts, special bolts. Rivets, spikes, threaded rods and lag screws. We make them all! In three modern West Coast plants we turn them out in hundreds of sizes and types, controlling every step from melting the steel to the final inspection and packaging. That's why the threads are clean, smooth-fitting . . . and the heads are easy to grip. Remember Bethlehem Pacific next time you need good bolts. Your nearest jobber has these fasteners in the sizes and types you need, and can give you speedy delivery. Bethlehem Pacific Coast Steel Corporation, 20th and Illinois St., San Francisco 19.

BETHLEHEM PACIFIC

BETHLEHEM STEEL

THE West ON ITS WAY

NEW PLANTS, EXPANSIONS, NEW INDUSTRIES, PRODUCTION CONTRACTS, DEVELOPMENT PROJECTS, UTILIZATION OF RESOURCES

INDUSTRIAL HIGHLIGHTS

. . . read details under state headings

Hughes Aircraft expands Tucson operation (p. 101)

Norton Co. plans $1,000,000 California plant (p. 102)

Fullerton construction underway for Arcadia Metal (p. 102)

North American adds $3,000,000 building at Downey (p. 102)

New Los Angeles plant for Sealright Pacific (p. 104)

American Brass plans $13,000,000 mill in Los Angeles (p. 104)

Longview Fibre Co. buys 77 acres in Oregon (p. 106)

ALASKA

POWER STUDY — Georgia-Pacific Alaska Co., Juneau subsidiary of Georgia-Pacific Plywood Corp., applies for preliminary permit from Federal Power Commission to investigate proposed hydroelectric project on Lemon Creek, near Juneau. Project would include two dams and powerhouse. Company is reportedly interested in power and water supplies for future paper mill in Juneau area.

ARIZONA

ANOTHER PHOENIX FACTORY — Regan Engineering Corp. of Milwaukee, headed by A. L. Regan, completes 100 x 140 ft. office and engineering building at 1000 S. 24th St., Phoenix, where production of line of industrial heating elements is underway, pending completion of a 100 x 365 ft. factory building adjoining. Products include strip, fin, ring, immersion and cartridge heaters.

NEW PRODUCT FOR PRESCOTT—Construction of plant building begins for Air-Lock Log Co., Inc., two miles from Prescott, to be in full production by summer, employing 20 persons. Plant will process ponderosa pine logs by patented method now used by only one other factory, located in Montana, to produce tongue-and-grooved logs for "do-it-yourself" construction of cabins.

MORE SPACE FOR HUGHES—Hughes Aircraft Co. leases 100,000 ft. of space in four adjoining buildings within Tucson, to be used for warehouse and office space. Company will reportedly add about 500 employees for this new operation.

CALIFORNIA

STAINLESS STEEL PROCESSING — New branch plant in Montebello opens for Stainless Processing Division of Wall Colmonoy Corp., Detroit, Mich. Plant, headed by Murray J. Granger, will provide contract brazing and heat treating facilities for stainless steel alloys and aircraft components.

AT WORK—Construction begins on $1,300,000 administrative and engineering building at Los Angeles plant of AiResearch Manufacturing Division of Garrett Corp.

BOX SPRINGS AND MATTRESSES—Harbor Furniture Manufacturing Co., Hollydale, sets up new division for production of bedding in recently acquired factory in Los Angeles.

RAYCON RELOCATES—Raycon Corp., manufacturer of high-speed mechanical counters, moves from Redwood City to new building in Belmont.

SPACE DOUBLED—Motordyne, Inc., manufacturer of fractional horsepower motors, dynamotors, and inverters, adds over 14,000 sq. ft. of space to its Monrovia plant, expanding total area to 28,000 sq. ft.

MERGER — International Resistance Co., Philadelphia, acquires all divisions of Hycor Co., Inc., North Hollywood manufacturer of Precision wire-wound resistors, magnetic amplifiers, and other electronic equipment.

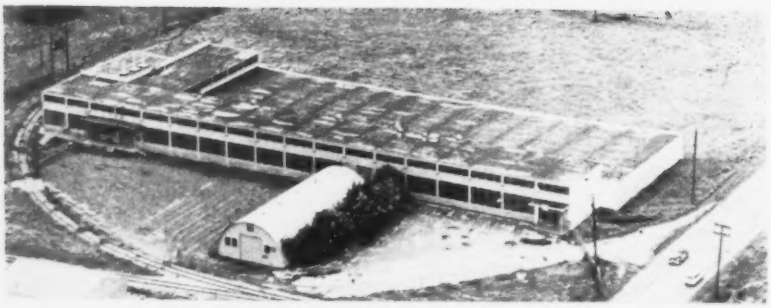
BUY STERLING PRODUCTS—Standard Packaging Corp. of New York acquires all paper plate manufacturing facilities, including lease on Los Angeles plant, of Sterling Products, Inc. Lou Levine, former Sterling president, will form new company to continue

A section of the May 1955 issue

Western Industry

. . . serving industry in the nation's fastest growing region.

609 Mission Street
San Francisco 5, Calif.



PLANNED FOR SANTA CLARA—Norton Co. of Worcester, Mass., will establish wheel making plant in one-story building purchased last fall at Santa Clara—reportedly first on West Coast to manufacture full line of vitrified, organic, and diamond wheels. Renovations and equipment will cost estimated $1,000,000 with production scheduled for late this year. Plant manager is George A. Garrison.

processing of paper cups and aluminum foil plates, as well as acting as manufacturer's representative on mill lines formerly carried by Sterling.

BUYING AND BUILDING—Industrial Asphalt, subsidiary of Atlas Investment Corp. of Los Angeles, buys three asphalt plants, located in Upland, Mira Loma, and San Bernardino, from retiring stockholders of George Herz & Co. Industrial Asphalt is also planning to erect a $160,000 asphalt plant in San Bernardino, which is now being manufactured by Standard Steel Corp. of Los Angeles. Total number of asphalt plants owned and operated by company will then reach fifteen.

NAME CHANGE—New name of Fox Hills Tool and Die, Culver City, is Product Packaging Engineering, under same ownership and management.

S. P. RESEARCH—Southern Pacific Co. sets up new Department of Research and Mechanical Standards, with headquarters in San Francisco, to coordinate research activities, some of which are joint projects with Stanford Research Institute. Company's field laboratories are at Sacramento, Roseville, Ogden, Los Angeles, and El Paso.

OPTICS SPECIALISTS — Applied Research Laboratories, Glendale, install facilities for design and manufacture of x-ray and gamma ray optical elements and instruments. Dr. J. W. M. DuMond, of California Institute of Technology, has been engaged as consultant on design of instruments.

ELECTRONICS MERGER — Electronic Specialty Co., Los Angeles, acquires controlling interest in Electromec, Inc., of Burbank, which will be operated as an affiliate under existing management.

PACE SETTER—Arcadia Metal Products, manufacturer of sliding glass doors, begins construction of 50,000-sq. ft. building in Fullerton. Designed by A. Quincy Jones and Frederick E. Emmons, A.I.A., building is planned around garden courts and terraces, with floor-to-ceiling glass in office structure.

CEC RESEARCH EXPANSION—Consolidated Engineering Corp. plans to build $1,500,000 building this summer on 8-acre site adjoining company's main plant in Hastings Ranch area of Pasadena, to house research, engineering, and marketing divisions.

NEW TO WEST—Fabriform Metal Products, Division of George Getz Corp., Los Angeles, puts into full-scale operation new hydrogen furnace brazing equipment valued at $100,000. Equipment reportedly permits successful copper brazing of stainless steel, nickel-alloy brazing, high-temperature silver brazing for metal parts weighing up to 2,000 lb., and other services.

FORM MEXICAN DIVISION—Utility Appliance Corp., Los Angeles, in first step of planned international expansion, organizes Mexican company, Utility S.A. de C.V., located at Torreon, Coahuila, and acquires plant there for assembling coolers, refrigeration units, and combination heating and air conditioning units.

UAL ORDERS PLANES—United Air Lines places order for 26 four-engined Douglas aircraft, at estimated cost of $42,500,000, which together with 17 already on order will give United 43 more aircraft, at a total cost of $64,800,000, to cover its "interim" needs for next several years until jet equipment is practical. Deliveries are scheduled for 1956 and 1957.

BUY JORDAN ELECTRONIC—Panellit, Inc., Chicago, acquires Jordan Electronic Mfg. Co., Inc., of Pasadena, producer of automatic control and data reduction information systems, to be operated as wholly-owned subsidiary. Panellit, now building new manufacturing plant in Alhambra, will move Jordan operations and its own Western Division in Los Angeles into new facility, which is scheduled for completion this month.

ADD TO DOWNEY PLANT—North American Aviation, Inc., is adding a $3,000,000 electromechanical building and cafeteria at its Downey operation. The two structures, providing 229,000-sq. ft. of floor area, will be completed by autumn.

BUILDING CAPACITORS FOR WEST—New addition to San Fernando Electric Manufacturing Co., San Fernando, Calif., expands total floor space to 15,500 sq. ft., specially designed for production of hermetically-sealed capacitors and filters to military and industrial specifications. Special facilities include test, research, and development laboratories, automatic winding machines, pressurized impregnation system, and induction soldering machines, as well as filtered, humidity-controlled air, conditioned by refrigeration.

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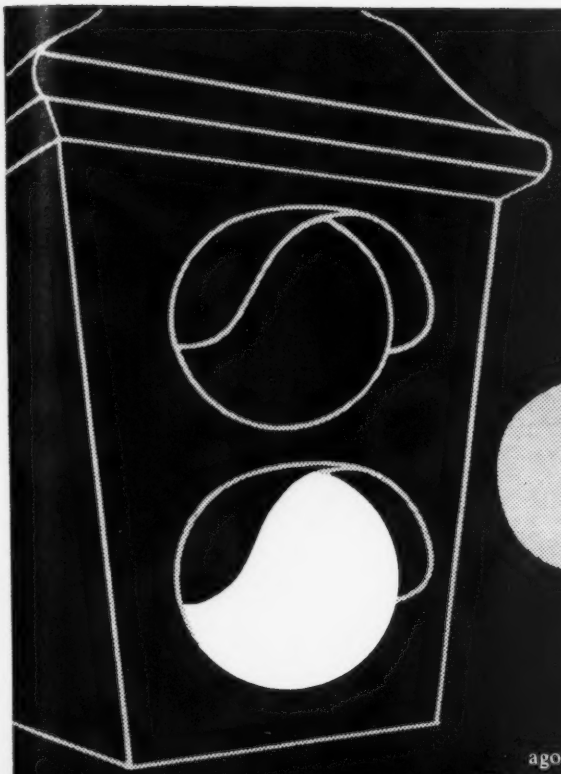

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SEALRIGHT PACIFIC—New factory for manufacture of paper food containers and bottle closures opened recently by Sealright Pacific, Ltd., on ten acres of Union Pacific industrial area in Los Angeles. Company, a Western associate of Sealright Co., Inc., began its operations in Los Angeles in 1931 and outgrew a factory built in 1941.

SOLAR RESEARCH—Solar Aircraft Co., San Diego, is installing $100,000 research facility for testing gas turbine engines, to include 1,800 hp. diesel engine, weighing almost 20 tons, and the structure which will be built around it. Building will contain five test cells, making a total of 19 test cells for Solar's research, development, and production testing of engines.

MILL AT RUBICON—Stockton Box Co., Stockton, plans to build mill in Rubicon area of Placer county starting this year, to be in operation by late 1956. Equipment and personnel will be moved from company's West Point operation in Calaveras county.

BUY TANKERS ABROAD — Four tankers have been ordered from French shipyards, and two from Japanese, by Tide Water Associated Oil Co., San Francisco. These are among 35 on order in foreign yards for U.S. owners reported by American Bureau of Shipping.

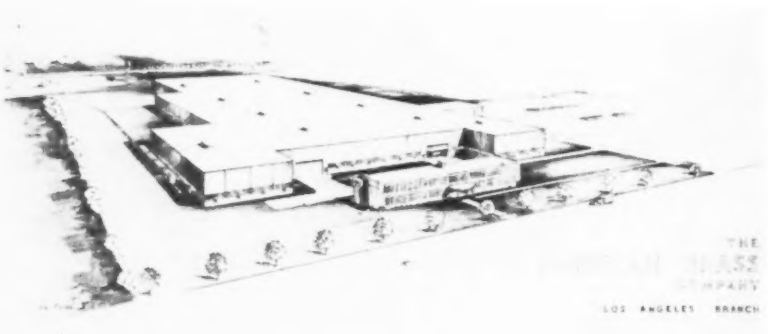
PORT BUILDS PLANT—Port of Oakland will build cannery and warehouse building at cost of over $240,000 for 25-year lease to Calo Dog Food Co., Inc., of Oakland, now occupying four separate buildings.

CONCRETE GROWTH — Whiteman Manufacturing Co., Los Angeles, buys Concrete Equipment Manufacturing Co., also Los Angeles, which manufactures transit concrete mixers. Acquired line of equipment, as well as Whiteman products, will be manufactured at plants now under construction for Whiteman at Pacoima, one of them—50,000 sq. ft. in area, costing $350,000—to be completed in January 1956; the other—of the same size and costing $200,000—to be completed in June 1956.

BIGGER GLOBE — Globe Electrical Manufacturing Co. moves to larger quarters in Gardena.

PAINT MERGER — Sillers Paint and Varnish Co., Los Angeles, becomes an affiliate of Benjamin Moore and Co., New York, which operates seven paint factories in United States and two in Canada. Sillers Paint will continue to operate in West as autonomous unit with present same and personnel.

DIAMOND DEAL—National Diamond Laboratory of California is formed in Glendale and leases 2,500-sq. ft. factory for manufacture of diamond tools, wheels, hones, and powder. Firm is an affiliate of National Diamond Laboratory, New York City.



$13,000,000 BRASS MILL—Architect's sketch of American Brass Co. mill for production of copper and copper-base alloys, to be built in Paramount district of Los Angeles. In full operation, now scheduled for 1957, mill will employ 500 persons.

MILLBRAE HEADQUARTERS — De Laval Pacific Co. and De Laval Turbine Pacific Co., both of San Francisco, are building $500,000 headquarters in Millsdale Industrial Park at Millbrae, to be completed by June 30. Plant, warehouse, and offices will employ about 50 persons.

NEW PACKAGING SERVICE—Product Packaging Engineering, Culver City, forms a contract packaging division to specialize in protective packaging of small industrial products to government specifications or commercial requirements. Two series of packaging machines are now available on contract basis.

BUILDS PARTS FOR EAST—Sunnyvale plant of Westinghouse Electric Corp. receives three new orders for wind tunnel equipment valued at $1,300,000. Installations are Cornell Aeronautical Laboratory, Inc., Buffalo, N.Y.; U. S. Navy wind tunnel adjoining David Taylor Model Basin in Carderock, Md.; U. S. Air Force propulsion wind tunnel at Tullahoma, Tenn., for which Sunnyvale plant is also building compressors.

EXPANDING IN WEST—Lindberg Industrial Corp., Chicago, plans to enlarge manufacturing facilities in Downey to meet demands for field-erected machinery in West.

REFLIN MOVES—Reflin Co. moves offices and plant from Gardena to 15,000 sq. ft., $125,000 plant in San Diego. Company manufactures polyester-resin, reinforced plastic pipe.

LOCKHEED PROJECTS — Lockheed Aircraft Service, Inc., is awarded Air Force contract for installation of special equipment on B-50 aircraft, in program which will extend over a period of months. Lockheed Aircraft Corp., Burbank, will open second field base for its missile systems division at Patrick Air Force Base, Fla. (long-range guided missile test facility).

AXELSON-FRAY—Axelson Manufacturing Co., division of U. S. Industries, buys Fray line of milling machines and attachments from Fray Machine Co., Burbank.

SECOND PLANT FOR WESTCO—Westco Steel Co., Oakland, buys inventory, plant, and site of Chicago Ornamental Iron Co. in North Hollywood, to be operated as Westco Southern Division. Company, which fabricates steel and iron for construction, is a subsidiary of American Bobbin Co. of New York.

COLORADO

SHALE PILOT PLANT — Union Oil Co. of Calif. picks Stearns-Roger Manufacturing Co. of Denver as engineering contractor for proposed shale demonstration plant to be built in Garfield County. Work now under way covers site selection, construction scheduling, and other details of project.

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STILL GROWING—Expanded steel pipe mill at Provo, Utah, of Consolidated Western Steel Division, U. S. Steel Corp., begins production of steel gas line pipe. Work is in progress on second manufacturing mill, which will produce small diameter line and water pipe, in a work bay beside big pipe line. Both operations will be housed in this building, which covers more than five acres, 980 ft. in length plus a 300-ft. shipping bay and 180-ft. receiving bay.

IDAHO

WORLD'S LARGEST — Rare Metals Corp. of America, subsidiary of El Paso Natural Gas Co., will build 175-ton-per-day mercury recovery unit at Weiser, to be in operation by end of this year. This is reportedly largest single unit of the kind in the world. Building contract is awarded Gordon I. Gould Co., San Francisco.

WOO BOEING—Action committee is appointed by Idaho's Governor Robert E. Smylie to persuade Boeing Airplane Co. to locate proposed bomber modification plant in Boise.

MONTANA

PROMOTE NEW INDUSTRY—Manganese Inc. of Henderson, Nev., contracts with Engineering Experiment Station at Montana State College, Bozeman, to study commercial possibilities of producing dry cell batteries from manganese ores at Henderson. Experiment Station will build 25 to 50-lb.-per-day pilot plant producing battery active manganese dioxide, and if operation is successful, Manganese Inc. will reportedly build commercial plant at Henderson.

NEW MEXICO

KAISER OPTIONS COAL — Kaiser Steel Corp. signs option to purchase Colfax county coal land and properties valued at about $3,500,000 in agreement with St. Louis, Rocky Mountain and Pacific Co. of Raton. Soft coal would presumably supply cooking needs of Kaiser mills at Fontana, Calif.

GAS TERMINAL IN ALBUQUERQUE —Texas Co. is building terminal and bulk plant facilities in Albuquerque to store motor gasoline and diesel fuel received through Standard Pipeline from El Paso. Terminal, to have storage capacity of 90,000 bbl., will be completed by June.

"FOR RENT"—Village of Deming embarks on $15,000,000 program for obtaining and constructing industrial property which will then be leased to small businesses. Facilities of Hosdreg Co., Inc., arms manufacturer, will be purchased initially, in a plan to attract new industries through favorable lease arrangements.

STEEL WAREHOUSE SOLD—Industrial Steel Inc., Albuquerque, is sold to Silver Steel Co. of Albuquerque and Denver. Sale includes warehouses at Durango, Colo., and Gallup, Clovis, Aztec, Lovington, and Roswell. Former owner, Eugene L. Garcia, will continue in steel line with newly organized firm, National Sales Inc.

BUILDING TRUCKS FOR CONTINENTAL—Williamsen Body and Equipment Co. of Ogden is named sole manufacturer for all aluminum truck body needs of Continental Baking Co.'s twelve West Coast area plants. Initial order covers 30 custom truck bodies to be delivered during first quarter of 1955. Studying specifications are (left to right): L. Clair Williamsen, vice president and chief engineer of this firm; Fred A. Kuhlmann, manager, Continental Baking; Ronald E. Urry, secretary-treasurer, Williamsen; and Daniel D. Dale, manager, Weber County Industrial Bureau.

OREGON

CROWN ZELLERBACH PROGRESS—Crown Zellerbach Corp.'s Western Waxed Paper division, North Portland, begins production of polyethylene coated papers for packaging uses. Company also announces plans for building green veneer mill is Columbia River area near Portland, at estimated cost of $750,000, to have annual capacity of about 87,000,000 ft. of 3/8 in. green veneer.

REMODELING MILL—Heppner Pine Mills plant at Heppner, owned by Maurice Hitchcock and Dant and Russell, starts work on modernization program at a cost of over $250,000, which will include electrification throughout, installation of a burner, and moving dry kilns and offices.

MODERNIZING — Portland Manufacturing Co. plans $200,000 expansion of its Portland plant, to include $150,000 for construction of new wing to house woodworking division, which will almost double work crew, now 50 men. Remaining $50,000 will be used for new equipment. Company also inaugurates profit-sharing plan whereby 25% of profits before taxes are put into trust fund, with shares to employees based on earned wages and years of employment.

OIL EXPLORATION—General Petroleum Corp. may undertake program of oil exploration in Oregon and Washington within the next year, according to Robert L. Minckler, president, speaking in Portland.

NEW VENTURE—Western Products Corp. is organized in Medford and plans to buy and operate one or more plants for veneer, plywood, and other wood products. Enterprises will reportedly be employee-owned.

BUY PLANT SITE — Longview Fibre Co., Longview, Wash., acquires 77-acre industrial site on which it has held option near Springfield, for construction of pulp plant. A pilot plant to be built and operated at Longview by July will explore pulping processes for proposed Springfield operation.

ASTORIA DRAWS FIRM — Phillips-Drucker Co. of St. Louis, manufacturer of surgical and laboratory equipment, negotiates with city officials of Astoria to buy 54-acre tract of land containing

former naval hospital. Company plans to set up 20,000-ft. factory, probably using existing building on site, and make other land in tract available for resale to small businesses.

UTAH

OPEN FOR BUSINESS—New diesel engine rebuilding plant of General Motors Corp., Electro-Motive Division, opens in North Salt Lake City, employing over 100 persons.

WASHINGTON

EXPAND FREEZER PLANT—Cascade Frozen Foods Inc., Burlington, will invest almost $100,000 in expanded plant facilities this year.

NUCLEAR POWER STUDY—Atomic Energy Commission approves reactor development study to be carried on by Puget Sound Utilities Council, composed of following five utilities in Washington: Department of Lighting of City of Seattle, Public Utility District No. 1 of Snohomish County, and Public Utility District No. 1 of Chelan County.

OUTPUT RISING—Bethlehem Pacific Coast Steel Corp. puts fourth basic open hearth furnace in operation at its Seattle plant, which is now operating at 93% of capacity, with production of 19,000 tons of ingots per month. Total of 1,125 men are employed at plant. This is Seattle plant's highest operating capacity since the Korean War.

BUY MALAGA PLANT — Peshastin Lumber and Box Co. buys sawmill, box factory, and timber of Northwest Wholesale Cooperative at Malaga.

WIND TUNNEL FOR BOEING—Contract for $2,000,000 supersonic wind tunnel is awarded Pittsburgh-Des Moines Steel Co. by Boeing Airplane Co. of Seattle. Architectural and engineering work for appurtenant buildings, reported to cost above $300,000, is subcontracted by Pittsburgh-Des Moines to Harmon, Pray and Detrich of Seattle.

NEW MILLWORK SHOP—Van Petten Lumber Co. builds additional millwork shop, first unit of proposed expansion program for this Walla Walla firm.

MOVE TO CENTRALIA — Plant has been picked in Centralia by Portland firm, Electran Co., to house its transformer manufacturing operations which will be mover from Portland. Firm will reportedly be known as Economy Transformer Co. and will employ about 40 people.

CHANGE OF MIND — Weyerhaeuser Timber Co. decides against building its proposed pulp mill in the Willapa Harbor area. Cost of water, combined with the danger to the Willapa oyster beds, led to the decision.

CALL FOR BIDS—Washington Water Power Co. announces plans to call for competitive bids on $2,200,000 worth of office and service center buildings for its Ross Park development in northeast Spokane.

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The West Coast Division is a major producer of parts for auto assembly plants and other fast-growing West Coast industries. Products include window channel and weatherstrip, plus a wide variety of other parts made from metal, rubber and fabric.

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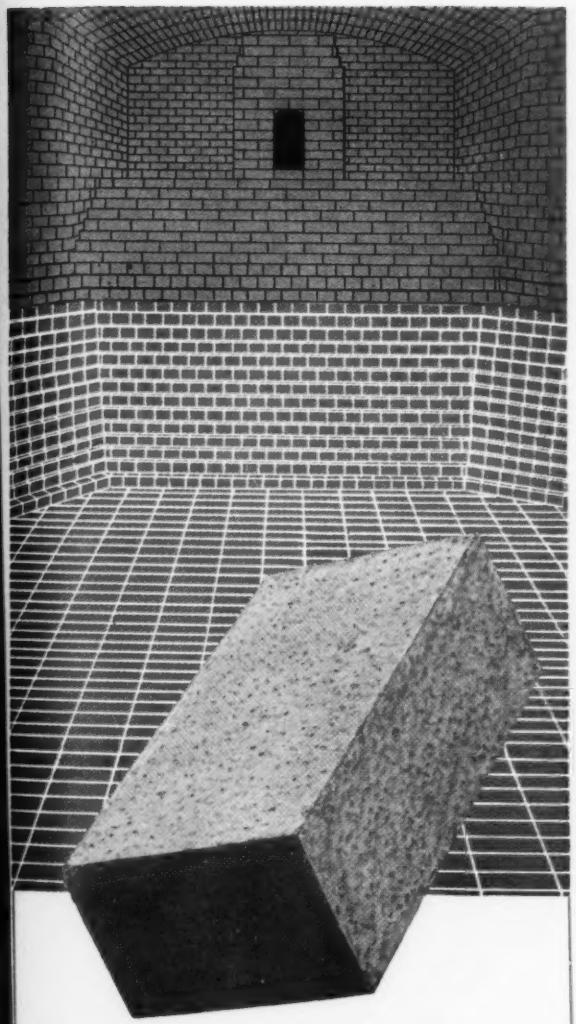

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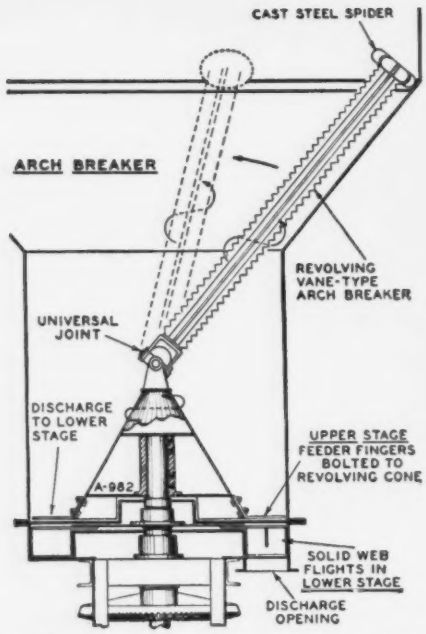
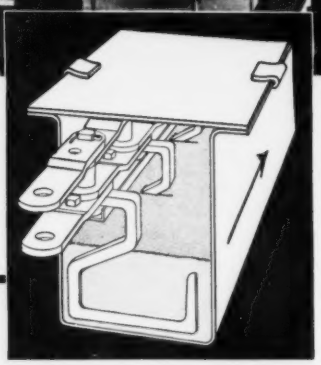


DRAWING shows S-A Bin Discharger at Stylon Corporation. Revolving arch breaker prevents material from "hanging-up" on bin walls. "Fingers" at base of cone feed clay mix in uniform volume to trough where solid web flights move it to the discharge opening.

DISTRIBUTING CONVEYOR HANGS FROM CEILING. Lightweight plus rigid construction of REDLER side-pull unit permits it to be hung from ceiling above tile presses.



CROSS-SECTION through REDLER side-pull type conveyor shows how skeleton flights and chain links traveling on track guide move bulk material without jamming, even if no material is withdrawn.

This REDLER Conveying System Moves Tricky Clay Mix without Dust or Jamming

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After it is unloaded from box cars, the clay mix is picked up by a completely sealed Z-type REDLER Conveyor-Elevator which carries it from blenders to storage tanks at the rate of 3-tons per hour. Inside the storage tanks, the mix becomes extremely tricky. It is likely to be packed solid one moment, then be flowing like water the next. To provide a steady flow to processing, an S-A Bin Discharger with a rotating arch breaker and "fingers" prevents the material from jamming or "hanging-up" on the walls.

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